PATENT ROOM

Vol. 1125 Number 4

OFFICIAL GAZETTE

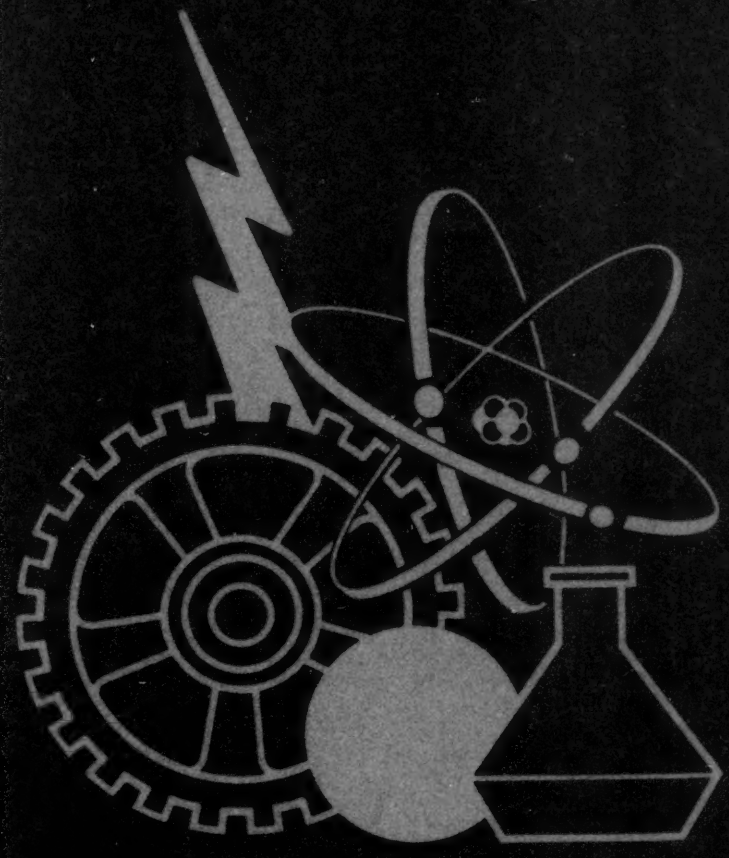
of the

UNITED STATES PATENT AND TRADEMARK OFFICE

Route to:

PATENTS

April 23, 1991



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OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed.

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.

THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.

GENERAL INFORMATION concerning PATENTS.

GENERAL INFORMATION concerning TRADEMARKS.

COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.50 each; PLANT PATENTS in color, $10.00 each; copies of TRADEMARKS at $1.50 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1120 O.G. 54 on Nov. 27, 1990.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2 on July 7, 1987 and at 1091 O.G. 2 on June 7, 1988. There is no longer a limit on the number of such international applications accepted for international preliminary examination by the European Patent Office; see the notice appearing at 1116 O.G. 32, on July 17,1990.

The search fee of the European Patent Office was changed due to a difference in the amount of the fee in German Marks and the exchange rate of the U.S. dollar in relation to the German Mark as of Jan. 3, 1991, and was announced in the *Official Gazette* at 1122 O.G. 564 on Jan 1, 1991.

International fees were changed on March 1, 1991 due to a difference in the exchange rate of the U.S. dollar in relation to the Swiss Franc and were announced in the *Official Gazette* at 1122 O.G. 629 on Jan. 22, 1991.

Certain domestic PCT fees and charges for International Search and Preliminary Examination have been changed effective Apr. 17, 1989 and were announced in the *Official Gazette* at 1100 O.G. 24 on Mar. 7, 1989.

The current schedule of PCT fees (in U.S. dollars) is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office (USPTO) as International Searching Authority (ISA)	
—No corresponding prior U.S. national application filed	550.00
—Corresponding prior U.S. national application filed	380.00
—Supplemental search fee, per additional invention	150.00
European Patent Office as ISA	1492.00
Preliminary examination fee	
USPTO as International Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as ISA	400.00
—Additional examination fee, per additional invention	130.00
—ISA not the USPTO	600.00
—Additional examination fee, per additional invention	200.00
International fees	
Basic fee	559.00
Basic Supplemental fee (for each page over 30)	11.00
Designation fee per country or region for the first 10 national or regional offices	135.00
Designation fee for 11th and subsequent designations	No Charge
Handling fee	171.00

U.S. National Stage fees

	Small Entity	Regular
USPTO was IPEA	165.00	330.00
USPTO was ISA but not IPEA	185.00	370.00
USPTO was neither ISA nor IPEA	250.00	500.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(2) to (4)	25.00	50.00
—For each independent claim in excess of 3	18.00	36.00
—For each claim in excess of 20	6.00	12.00
—For each application containing a multiple dependent claim	60.00	120.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39(1)	60.00	120.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39(1)	30.00	30.00

Dec. 21, 1990

HARRY F. MANBECK, Jr.
Assistant Secretary and Commissioner of Patents and Trademarks.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on application filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Apr. 17, 1989. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the patent.

Attention is drawn to the patents which were issued on April 19, 1988 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,737,994 through 4,739,521
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on April 17, 1984 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,442,551 through 4,443,890
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months and seven years and six months are set forth in 37 CFR 1.20(e), and (f), as amended Nov. 5, 1990, which are reproduced below:

37 CFR § 1.20 Post-issuance fees and surcharges

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant.....$245.00

"(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant.....$495.00"

"(h) For maintaining an original or reissue patent except a design or plant patent, based on an application filed on or after Aug. 27,1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9(f)).....$415.00
By other than a small entity.....$850.00"

"(i) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§1.9(f)).....$835.00
By other than a small enttity.....$1670.00"

The amounts of the surcharges for paying the maintenance fee during the grace period or after the expiration of the patent are set forth in 37 CFR 1.20(k), (l) and (m), which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months , seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27,1982.....$120.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity(§1.9(f)).....$60.00
By other than a small entity.....$120.00"

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been unavoidable.....$550.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED FEBRUARY 10, 1991
DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,371,983	06/221,914	2/08/83
4,371,992	06/299,598	2/08/83
4,371,998	06/221,876	2/08/83
4,372,019	06/230,478	2/08/83
4,372,024	06/270,770	2/08/83
4,372,041	06/245,252	2/08/83
4,372,045	06/233,425	2/08/83
4,372,049	06/278,174	2/08/83
4,372,071	06/301,548	2/08/83
4,372,075	06/245,866	2/08/83
4,372,079	06/227,184	2/08/83
4,372,083	06/278,589	2/08/83
4,372,107	06/217,570	2/08/83
4,372,131	06/284,482	2/08/86
4,372,157	06/251,907	2/08/83
4,372,158	06/274,705	2/08/83
4,372,159	06/274,706	2/08/83
4,372,185	06/237,268	2/08/83
4,372,186	06/235,004	2/08/83
4,372,187	06/259,519	2/08/83
4,372,189	06/347,980	2/08/83
4,372,196	06/249,169	2/08/83
4,372,200	06/260,101	2/08/83
4,372,201	06/278,376	2/08/83
4,372,208	06/249,913	2/08/83
4,372,209	06/311,294	2/08/83
4,372,225	06/241,239	2/08/83
4,372,226	06/258,993	2/08/83
4,372,229	06/237,633	2/08/83
4,372,241	06/223,728	2/08/83
4,372,242	06/248,749	2/08/83
4,372,247	06/381,814	2/08/83
4,372,251	06/248,249	2/08/83
4,372,254	06/227,626	2/08/83
4,372,262	06/304,473	2/08/83
4,372,292	06/254,054	2/08/83
4,372,293	06/219,670	2/08/83
4,372,310	06/288,637	2/08/83
4,372,328	06/265,640	2/08/83
4,372,332	06/229,207	2/08/83
4,372,335	06/237,769	2/08/83
4,372,348	06/232,160	2/08/83
4,372,357	06/218,271	2/08/83
4,372,359	06/258,988	2/08/83
4,372,360	06/288,058	2/08/83
4,372,372	06/228,331	2/08/83
4,372,377	06/243,682	2/08/83
4,372,382	06/216,742	2/08/83
4,372,383	06/270,261	2/08/83
4,372,395	06/319,725	2/08/83
4,372,402	06/313,527	2/08/83
4,372,403	06/301,766	2/08/83
4,372,422	06/220,966	2/08/83
4,372,426	06/350,703	2/08/83
4,372,475	06/258,586	2/08/83
4,372,480	06/259,677	2/08/83
4,372,530	06/270,910	2/08/83
4,372,536	06/241,251	2/08/83
4,372,541	06/303,868	2/08/83
4,372,543	06/263,601	2/08/83
4,372,546	06/247,347	2/08/83
4,372,548	06/241,887	2/08/83
4,372,560	06/283,952	2/08/83
4,372,561	06/303,847	2/08/83
4,372,592	06/219,982	2/08/83
4,372,620	06/231,458	2/08/83
4,372,631	06/308,146	2/08/83
4,372,640	06/246,389	2/08/83
4,372,658	06/247,541	2/08/83
4,372,660	06/258,493	2/08/83
4,372,662	06/300,970	2/08/83
4,372,671	06/251,414	2/08/83
4,372,672	06/219,122	2/08/83
4,372,678	06/241,143	2/08/83
4,372,690	06/241,467	2/08/83
4,372,691	06/231,664	2/08/83
4,372,697	06/276,285	2/08/83
4,372,699	06/283,694	2/08/83
4,372,700	06/276,847	2/08/83
4,372,703	06/224,245	2/08/83
4,372,725	06/355,276	2/08/83
4,372,727	06/248,972	2/08/83
4,372,728	06/222,255	2/08/83
4,372,735	06/250,495	2/08/83

Patent Number	Serial Number	Issue Date
4,372,747	06/288,777	2/08/83
4,372,748	06/293,548	2/08/83
4,372,756	06/278,992	2/08/83
4,372,762	06/232,855	2/08/83
4,372,763	06/248,697	2/08/83
4,372,784	06/295,218	2/08/83
4,372,787	06/280,908	2/08/83
4,372,811	06/260,436	2/08/83
4,372,815	06/293,075	2/08/83
4,372,819	06/360,601	2/08/83
4,372,823	06/312,098	2/08/83
4,372,828	06/347,919	2/08/83
4,372,829	06/246,330	2/08/83
4,372,833	06/254,588	2/08/83
4,372,853	06/269,459	2/08/83
4,372,858	06/302,593	2/08/83
4,372,870	06/286,497	2/08/83
4,372,892	06/276,807	2/08/83
4,372,897	06/254,605	2/08/83
4,372,899	06/247,478	2/08/83
4,372,902	06/337,025	2/08/83
4,372,906	06/223,434	2/08/83
4,372,921	06/328,701	2/08/83
4,372,926	06/256,533	2/08/83
4,372,938	06/370,670	2/08/83
4,372,945	06/289,138	2/08/83
4,372,952	06/253,026	2/08/83
4,372,954	06/308,546	2/08/83
4,372,960	06/215,959	2/08/83
4,372,966	06/290,114	2/08/83
4,372,973	06/332,840	2/08/83
4,372,995	06/271,128	2/08/83
4,373,001	06/365,358	2/08/83
4,373,003	06/365,950	2/08/83
4,373,005	06/263,169	2/08/83
4,373,016	06/262,827	2/08/83
4,373,033	06/289,214	2/08/83
4,373,040	06/270,914	2/08/83
4,373,058	06/244,811	2/08/83
4,373,068	06/303,219	2/08/83
4,373,070	06/296,212	2/08/83
4,373,075	06/330,424	2/08/83
4,373,089	06/240,007	2/08/83
4,373,094	06/288,072	2/08/83
4,373,098	06/294,790	2/08/83
4,373,105	06/242,558	2/08/83
4,373,124	06/377,264	2/08/83
4,373,128	06/220,725	2/08/83
4,373,132	06/290,140	2/08/83
4,373,142	06/235,797	2/08/83
4,373,144	06/217,216	2/08/83
4,373,173	06/245,562	2/08/83
4,641,380	06/801,209	2/10/87
4,641,389	06/727,820	2/10/87
4,641,390	06/779,349	2/10/87
4,641,413	06/528,997	2/10/87
4,641,415	06/735,045	2/10/87
4,641,421	06/774,248	2/10/87
4,641,430	06/808,646	2/10/87
4,641,431	06/798,838	2/10/87
4,641,437	06/667,131	2/10/87
4,641,439	06/704,705	2/10/87
4,641,440	06/729,064	2/10/87
4,641,441	06/582,561	2/10/87
4,641,447	06/706,177	2/10/87
4,641,455	06/777,920	2/10/87
4,641,457	06/656,409	2/10/87
4,641,459	06/836,436	2/10/87
4,641,463	06/714,983	2/10/87
4,641,465	06/706,570	2/10/87
4,641,468	06/771,030	2/10/87
4,641,478	06/830,321	2/10/87
4,641,483	06/773,375	2/10/87
4,641,487	06/784,424	2/10/87
4,641,498	06/430,406	2/10/87
4,641,501	06/826,901	2/10/87
4,641,505	06/707,383	2/10/87
4,641,507	06/577,517	2/10/87
4,641,509	06/787,958	2/10/87
4,641,510	06/791,790	2/10/87
4,641,514	06/553,168	2/10/87
4,641,518	06/762,065	2/10/87
4,641,519	06/755,680	2/10/87
4,641,521	06/708,024	2/10/87
4,641,524	06/765,727	2/10/87
4,641,529	06/599,481	2/10/87
4,641,540	06/729,523	2/10/87
4,641,542	06/744,557	2/10/87
4,641,544	06/787,316	2/10/87
4,641,545	06/725,182	2/10/87
4,641,550	06/728,500	2/10/87
4,641,560	06/806,607	2/10/87
4,641,561	06/828,880	2/10/87
4,641,562	06/766,287	2/10/87
4,641,567	06/499,206	2/10/87
4,641,569	06/720,244	2/10/87
4,641,583	06/634,553	2/10/87
4,641,590	06/754,294	2/10/87
4,641,595	06/733,087	2/10/87
4,641,598	06/716,268	2/10/87
4,641,600	06/853,512	2/10/87
4,641,612	06/751,480	2/10/87
4,641,633	06/726,922	2/10/87
4,641,638	06/786,226	2/10/87
4,641,647	06/699,927	2/10/87
4,641,650	06/710,431	2/10/87
4,641,661	06/761,790	2/10/87
4,641,662	06/655,378	2/10/87
4,641,669	06/724,930	2/10/87
4,641,674	06/574,988	2/10/87
4,641,680	06/768,896	2/10/87
4,641,686	06/683,063	2/10/87
4,641,691	06/613,390	2/10/87
4,641,692	06/743,568	2/10/87
4,641,694	06/819,588	2/10/87
4,641,701	06/400,942	2/10/87
4,641,712	06/690,585	2/10/87
4,641,713	06/570,925	2/10/87
4,641,715	06/535,042	2/10/87
4,641,722	06/775,499	2/10/87
4,641,738	06/800,097	2/10/87
4,641,744	06/746,683	2/10/87
4,641,769	06/847,132	2/10/87
4,641,772	06/703,222	2/10/87
4,641,780	06/278,164	2/10/87
4,641,784	06/603,909	2/10/87
4,641,786	06/682,262	2/10/87
4,641,789	06/565,601	2/10/87
4,641,797	06/606,866	2/10/87
4,641,814	06/650,762	2/10/87
4,641,815	06/873,345	2/10/87
4,641,817	06/590,953	2/10/87
4,641,822	06/725,298	2/10/87
4,641,824	06/801,676	2/10/87
4,641,833	06/594,521	2/10/87
4,641,834	06/721,520	2/10/87
4,641,835	06/707,722	2/10/87
4,641,836	06/749,650	2/10/87
4,641,837	06/742,694	2/10/87
4,641,840	06/776,487	2/10/87
4,641,844	06/835,427	2/10/87
4,641,845	06/694,604	2/10/87
4,641,848	06/723,370	2/10/87
4,641,849	06/742,578	2/10/87
4,641,852	06/794,446	2/10/87
4,641,859	06/839,224	2/10/87
4,641,860	06/624,412	2/10/87
4,641,863	06/797,043	2/10/87
4,641,870	06/796,251	2/10/87
4,641,873	06/838,410	2/10/87
4,641,889	06/773,364	2/10/87
4,641,897	06/611,903	2/10/87
4,641,899	06/757,826	2/10/87
4,641,900	06/831,178	2/10/87
4,641,909	06/771,139	2/10/87
4,641,910	06/641,674	2/10/87
4,641,919	06/559,289	2/10/87
4,641,921	06/715,022	2/10/87

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4,641,923	06/624,119	2/10/87
4,641,925	06/841,988	2/10/87
4,641,966	06/761,449	2/10/87
4,641,974	06/715,197	2/10/87
4,641,984	06/782,069	2/10/87
4,641,989	06/828,907	2/10/87
4,641,993	06/787,083	2/10/87
4,641,994	06/694,586	2/10/87
4,641,996	06/652,265	2/10/87
4,641,997	06/702,501	2/10/87
4,642,001	06/547,469	2/10/87
4,642,004	06/773,293	2/10/87
4,642,014	06/716,168	2/10/87
4,642,017	06/430,746	2/10/87
4,642,041	06/824,678	2/10/87
4,642,050	06/720,178	2/10/87
4,642,052	06/782,876	2/10/87
4,642,056	06/738,398	2/10/87
4,642,062	06/751,437	2/10/87
4,642,064	06/715,117	2/10/87
4,642,066	06/739,154	2/10/87
4,642,072	06/563,578	2/10/87
4,642,074	06/771,723	2/10/87
4,642,083	06/754,622	2/10/87
4,642,086	06/759,879	2/10/87
4,642,090	06/708,137	2/10/87
4,642,095	06/757,746	2/10/87
4,642,100	06/772,766	2/10/87
4,642,101	06/734,509	2/10/87
4,642,108	06/799,279	2/10/87
4,642,109	06/735,056	2/10/87
4,642,110	06/751,483	2/10/87
4,642,128	06/774,693	2/10/87
4,642,132	06/685,211	2/10/87
4,642,135	06/766,635	2/10/87
4,642,142	06/770,821	2/10/87
4,642,143	06/771,357	2/10/87
4,642,153	06/677,433	2/10/87
4,642,159	06/666,308	2/10/87
4,642,166	06/827,891	2/10/87
4,642,167	06/709,415	2/10/87
4,642,175	06/713,376	2/10/87
4,642,176	06/690,083	2/10/87
4,642,180	06/738,234	2/10/87
4,642,205	06/776,145	2/10/87
4,642,209	06/766,439	2/10/87
4,642,212	06/720,777	2/10/87
4,642,220	06/723,750	2/10/87
4,642,221	06/510,502	2/10/87
4,642,225	06/681,223	2/10/87
4,642,229	06/600,408	2/10/87
4,642,239	06/721,776	2/10/87
4,642,251	06/826,238	2/10/87
4,642,254	06/835,890	2/10/87
4,642,262	06/588,058	2/10/87
4,642,284	06/503,705	2/10/87
4,642,290	06/447,171	2/10/87
4,642,300	06/626,477	2/10/87
4,642,306	06/611,516	2/10/87
4,642,307	06/476,857	2/10/87
4,642,312	06/801,452	2/10/87
4,642,333	06/622,496	2/10/87
4,642,337	06/715,176	2/10/87
4,642,339	06/788,501	2/10/87
4,642,344	06/690,445	2/10/87
4,642,353	06/833,412	2/10/87
4,642,354	06/776,112	2/10/87
4,642,367	06/755,063	2/10/87
4,642,370	06/713,910	2/10/87
4,642,378	06/722,046	2/10/87
4,642,393	06/708,655	2/10/87
4,642,401	06/631,420	2/10/87
4,642,407	06/796,679	2/10/87
4,642,418	06/759,880	2/10/87
4,642,427	06/757,838	2/10/87
4,642,447	06/731,973	2/10/87
4,642,452	06/781,367	2/10/87
4,642,454	06/644,768	2/10/87
4,642,465	06/660,692	2/10/87
4,642,479	06/720,124	2/10/87
4,642,488	06/772,223	2/10/87
4,642,502	06/855,344	2/10/87
4,642,505	06/585,967	2/10/87
4,642,511	06/846,175	2/10/87
4,642,526	06/650,809	2/10/87
4,642,533	06/716,814	2/10/87
4,642,534	06/754,974	2/10/87
4,642,535	06/566,518	2/10/87
4,642,538	06/825,608	2/10/87
4,642,540	06/547,966	2/10/87
4,642,545	06/775,811	2/10/87
4,642,546	06/671,906	2/10/87
4,642,557	06/639,474	2/10/87
4,642,558	06/481,389	2/10/87
4,642,565	06/666,192	2/10/87
4,642,566	06/632,473	2/10/87
4,642,574	06/790,211	2/10/87
4,642,592	06/727,947	2/10/87
4,642,603	06/630,313	2/10/87
4,642,609	06/685,953	2/10/87
4,642,610	06/624,746	2/10/87
4,642,611	06/542,053	2/10/87
4,642,622	06/481,937	2/10/87
4,642,624	06/569,784	2/10/87
4,642,633	06/520,790	2/10/87
4,642,650	06/679,373	2/10/87
4,642,651	06/653,645	2/10/87
4,642,653	06/857,395	2/10/87
4,642,660	06/813,380	2/10/87
4,642,665	06/683,729	2/10/87
4,642,667	06/661,819	2/10/87
4,642,669	06/679,359	2/10/87
4,642,671	06/518,106	2/10/87
4,642,690	06/644,400	2/10/87
4,642,717	06/712,664	2/10/87
4,642,719	06/467,287	2/10/87
4,642,721	06/677,197	2/10/87
4,642,729	06/868,793	2/10/87
4,642,738	06/819,871	2/10/87
4,642,752	06/676,525	2/10/87
4,642,766	06/709,234	2/10/87
4,642,776	06/627,622	2/10/87
4,642,780	06/667,644	2/10/87
4,642,787	06/635,960	2/10/87
4,642,800	06/769,129	2/10/87
4,642,807	06/682,867	2/10/87
4,642,809	06/707,042	2/10/87

NOTIFICATION OF ACCEPTANCE OF DELAYED PAYMENT OF MAINTENANCE FEE (35 U.S.C. 41(c); 37 CFR 1.378)

The patent(s) listed below is considered as not having expired but is subject to the conditions set forth in 35 U.S.C. 41(c)(2), in view of the Petition to Accept Late Payment of the maintenance fees which has been GRANTED BY THE COMMISSIONER OF PATENTS AND TRADEMARKS, as provided for under 35 U.S.C. 41(c)(1) and 37 CFR 1.378.

Patent No.	Serial No.	Patent Date	Application Filing Date	Delayed Payment Acceptance Date
Re. 32,404 (4,489,812)	06/714,166 (06/516,031)	4/21/87 (12/25/84)	3/20/85 (7/22/83)	3/14/91

Patent No.	Serial No.	Patent Date	Application Filing Date	Delayed Payment Acceptance Date
4,498,277	06/533,921	2/12/85	9/20/83	3/15/91
4,509,525	06/422,174	4/09/85	9/23/82	3/14/91
4,537,261	06/585,240	8/27/85	3/01/84	3/14/91
4,598,940	06/681,286	7/08/86	12/13/84	3/18/91
4,615,509	06/790,608	10/07/86	10/23/85	3/14/91
4,630,421	06/803,134	12/23/86	11/29/85	3/12/91

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b).

4,771,012, Re. S. N. 07/581,781, Filed Sept. 13, 1990, Cl. 437/29, METHOD OF MAKING SYMMETRICALLY CONTROLLED IMPLANTED REGIONS USING ROTATIONAL ANGLE OF THE SUBSTRATE, Toshiki Yabu, et al., Owner of Record: *Matsushita Electric Industrial Co., Ltd., Osaka, Japan*, Attorney or Agent: V.M. Creedon, Ex. Gp.: 114

4,762,342, Re. S. N. 07/663,728, Filed Mar. 1, 1991, Cl. 282/9, MANIFOLD FORM ASSEMBLY, Gary J. Thompson, Owner of Record: *Inventor*, Attorney or Agent: Andrew S. McConnell, Ex. Gp.: 326

4,779,165, Re. S. N. 07/599,516, Filed Oct. 18, 1990, Cl. 360/97, DISK STORAGE DRIVE, Dieter Elsaesser, et al., Owner of Record: *Pabst-Motoren GmbH & Co., Kg., Black Forest, Germany*, Attorney or Agent: Wilford L. Wisner, Ex. Gp.: 233

4,779,455, Re. S. N. 07/603,008, Filed Oct. 25, 1990, Cl. 73/116, AIR-FUEL RATIO DETECTING SENSOR, Hiroshi Kuroiwa, et al., Owner of Record: *Hitachi, Ltd., Tokyo, Japan*, Attorney or Agent: John R. Mattingly, Ex. Gp.: 265

4,791,631, Re. S. N. 07/627,090, Filed Dec. 13, 1990, Cl. 372/22, WIDE TOLERENCE, MODULATED BLUE LASER SOURCE, Jean-Claude J. E. Baumert, et al., Owner of Record: *International Business Machines Corp., Armonk, N.Y.*, Attorney or Agent: Robert B. Martin, Ex. Gp.: 251

4,798,783, Re. S. N. 07/581,630, Filed Sept. 11, 1990, Cl. 430/372, METHOD OF PROCESSING SIBER HALIDE COLOR PHOTOGRAPHIC MATERIAL AND PHOTOGRAPHIC COLOR DEVELOPING COMPOSITION, Takatoshi Ishikawa, et al., Owner of Record: *Fuji Photo Film Co., Ltd., Kanagawa, Japan*, Attorney or Agent: Joseph J. Ruch, Ex. Gp.: 156

4,800,608, Re. S. N. 07/647,743, Filed Jan. 28, 1991, Cl. 15/167, TOOTHBRUSH, John R. Key, Owner of Record: *Inventor*, Attorney or Agent: Robert C. Shaddox, Ex. Gp.: 242

4,810,691, Re. S. N. 07/664,762, Filed Mar. 5, 1991, Cl. 514/2, POLYPEPTIDE CARTILAGE-INDUCING FACTORS FOUND IN BONE, Saeid Seyedin, et al., Owner of Record: *Celtrix Laboratoties, Palo Alto, Calif.*, Attorney or Agent: Kenneth M. Goldman, Ex. Gp.: 189

4,843,063, Re. S. N. 07/664,766, Filed Mar. 5, 1991, Cl. 514/2, POLYPEPTIDE CARTILAGE-INDUCING FACTORS FOUND IN BONE, Saeid Seyedin, et al., Owner of Record: *Celtrix Laboratoties, Palo Alto, Calif.*, Attorney or Agent: Kenneth M. Goldman, Ex. Gp.: 189

4,879,982, Re. S. N. 07/666,182, Filed Mar. 7, 1991, Cl. 123/339, METHOD OF AND APPARATUS FOR CONTROLLING ENGINE REVOLUTION SPEED, Tomiya Itakura, et al., Owner of Record: *Hitachi, Ltd. and Hitachi Automotive Engineering Co., Ltd., Tokyo and Katsuta-Shi, Japan*, Attorney or Agent: Donald R. Antonelli, Ex. Gp.: 342

4,896,334, Re. S. N. 07/666,728, Filed Mar. 8, 1991, Cl. 375/020, METHOD AND APPARATUS FOR TIMING RECOVERY, Babak Sayar, Owner of Record: *Northern Telecom Limited, Quebec, Canada*, Attorney or Agent: Arthur Schwartz, Ex. Gp.: 263

4,913,725, Re. S. N. 07/662,307, Filed Feb. 28, 1991, Cl. 71/92, GRANULAR FERTILIZER COMPOSITION, Akira Nishikawa, et al., Owner of Record: *Sumitomo Chemical Company, Ltd., Osaka, Japan*, Attorney or Agent: Marc J. Luddy, Ex. Gp.: 129

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b).

4,473,980, Reexam. No. 90/002,297, Requested Mar. 15, 1991, Cl. 052/202, THERMAL INSULATION STRUCTURE FOR WINDOWS, Kenneth J. Foster, Owner of Record: *Econ, Inc., Boston, Mass.*, Attorney or Agent: Paul J. Cook, Manchester, Mass., Ex. Gp.: 354, Requester: John Wilson James, Pravel, Gambrell, Hewitt, et al., Houston, Tex.

4,809,308, Reexam. No. 90/002,298, Requested Mar. 15, 1991, Cl. 378/099, METHOD AND APPARATUS FOR PERFORMING AUTOMATED CIRCUIT BOARD SOLDIER QUALITY INSPECTIONS, John Adams, et al., Owner of Record: *IRT Corp., San Diego, Calif.*, Attorney or Agent: Neil F. Martin, Brown, Martin, Haller & McClain, San Diego, Calif., Ex. Gp.: 256, Requester: Owner

4,893,422, Reexam. No. 90/002,299, Requested Mar. 15, 1991, Cl. 038/077.3, STEAM IRON WITH WATER SOFTENING FACILITY, Gotthard C. Mahlich, et al., Owner of Record: *Robert Krups, Stufting & Co. KG, Solingen, Fed'l. Republic of Germany*, Attorney or Agent: Peter K. Kontler, Stamford, Conn., Ex. Gp.: 247, Requester: Ralston, Ltd., Amsterdam, The Netherlands

Correction

On February 26, 1991, a notice appeared in the Official Gazette concerning In Vitro International Inc., an international depositary authority under the terms of the Budapest Treaty on International Recognition of the Deposit of Microorganisms for the Purposes of Patent Procedure. 1123 O.G. 59. The notice quoted a letter from the United States to the World Intellectual Property Organization stating that "it can no longer assure that IVI is able to continue to comply with the requirements of Article 6(2) of the Budapest Treaty with respect to any new deposits." This sentence should have read "with respect to any original deposits." The date of that letter should be March 4, 1991.

March 4, 1991

HARRY F. MANBECK, Jr.
Assistant Secretary and Commisssioner of Patents and Trademarks

Errata

"All reference to Patent No. 5,002,947 to Masayuki, et al., of Tokyo, Japan, for `4-OXOQQUINOLINE-3-CARBOXYLIC ACID DERIVATIVES AND THEIR USE' appearing in the Offical Gazette of Mar. 26, 1991 should be deleted since no patent was granted."

"All reference to Patent No. 5,003,071 to Udo Mayer of Federal Republic of Germany for `QUINOLINE COMPOUNDS' appearing in the Official Gazette of Mar. 26, 1991 should be deleted since no patent was granted."

In the list of patents which expired on Dec. 16, 1990, due to failure to pay maintenance fees, in the O.G. of Feb. 26, 1991, the following patent should not have appeared:

Patent No.	Serial No.	Issue Date	Filing Date
4,628,942	06/659,823	12/16/86	10/11/84

In the list of patents which expired on Dec. 2, 1990, due to failure to pay maintenance fees, in the O.G. of Feb. 12, 1991, the following patent should not have appeared:

Patent No.	Serial No.	Issue Date	Filing Date
Re. 32,639 (D. 287,000)	07/032,726 (06/582,780)	4/12/88 (12/02/86)	4/12/87 (2/23/87)

In the list of patents which expired on Apr. 1, 1990, due to failure to pay maintenance fees, in the O.G. of June 12, 1990, the following patent should not have appeared:

Patent No.	Serial No.	Issue Date	Filing Date
Re. 32,662 (4,322,080)	06/580,447 (06/132,092)	5/03/88 (3/30/82)	2/15/84 (3/20/80)

In the list of Patents in the NOTIFICATION OF ACCEPTANCE OF MAINTENANCE FEE (35 U.S.C. 41(c); 37 CFR 1.378) in the O.G. of Nov. 27, 1990 the following correction should be made:

Patent No. "4,355,166" should be —4,335,166—.

PATENT NOTICES

Certificates of Correction For Week of April 23, 1991

D. 306,776	4,829,641	4,883,914	4,904,659
PP. 6,802	4,832,692	4,884,138	4,904,738
Re. 33,520	4,834,921	4,884,978	4,905,191
4,476,111	4,836,267	4,886,471	4,905,344
4,669,694	4,836,869	4,886,737	4,906,764
4,688,324	4,837,623	4,887,224	4,906,857
4,708,205	4,837,786	4,887,986	4,906,970
4,735,282	4,837,802	4,888,223	4,906,978
4,752,877	4,839,750	4,888,379	4,907,199
4,755,208	4,842,015	4,889,599	4,907,251
4,756,186	4,842,063	4,889,893	4,907,525
4,758,563	4,843,563	4,890,650	4,909,564
4,770,179	4,843,975	4,891,736	4,909,688
4,773,414	4,844,297	4,892,094	4,909,936
4,775,973	4,844,372	4,892,834	4,909,963
4,776,608	4,844,777	4,894,543	4,910,416
4,783,529	4,846,102	4,894,555	4,910,584
4,789,073	4,847,796	4,894,679	4,910,594
4,795,411	4,851,009	4,895,531	4,912,525
4,800,882	4,853,443	4,895,584	4,913,527
4,801,142	4,853,972	4,895,996	4,914,779
4,808,729	4,855,681	4,896,029	4,916,768
4,809,291	4,855,935	4,896,794	4,917,320
4,810,198	4,856,348	4,897,277	4,918,077
4,814,861	4,856,541	4,897,732	4,918,125
4,815,491	4,858,131	4,897,819	4,920,882
4,816,380	4,858,733	4,898,182	4,923,897
4,816,491	4,860,526	4,900,076	4,927,948
4,817,586	4,865,599	4,900,114	4,936,834
4,818,773	4,865,922	4,900,612	4,944,560
4,822,722	4,866,532	4,902,346	4,960,983
4,823,951	4,872,455	4,902,434	4,967,209
4,824,881	4,873,360	4,902,818	4,972,427
4,825,406	4,874,048	4,902,988	4,972,530
4,825,514	4,876,601	4,903,521	4,979,845
4,825,596	4,881,484	4,903,923	4,990,373
4,826,984	4,882,653	4,904,168	
4,828,748	4,882,670	4,904,347	

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Box SN	For fee and petitions under 37 CFR 1.182 to obtain date received and/or serial number for patent applications *prior* to the Office's standard notification (return postcard or the official "Filing Receipt," "Notice to File Missing Parts," or "Notice of Incomplete Application").

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Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
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Nebraska	Lincoln: Engineering Library, University of Nebraska-Lincoln	(402) 472-3411
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New Jersey	Newark Public Library	(201) 733-7782
	Piscataway: Library of Science and Medicine, Rutgers University	(201) 932-2895
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	New York Public Library (The Research Libraries)	(212) 714-8529
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	Columbus: Ohio State University Libraries	(614) 292-6175
	Toledo/Lucas County Public Library	(419) 259-5212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 744-7086
Oregon	Salem: Oregon State Library	(503) 378-4239
Pennsylvania	Philadelphia, The Free Library of	(215) 686-5331
	Pittsburgh, Carnegie Library of	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861

Reference Collections of U. S. Patents Available for Public Use in Patent Depository Libraries—(continued)

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South Carolina	Charleston: Medical University of South Carolina Library	(803) 792-2372
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
	Nashville: Stevenson Science Library,Vanderbilt University	(615) 322-2775
Texas	Austin: McKinney Engineering Library, University of Texas at Austin	(512) 471-1610
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-2551
	Dallas Public Library	(214) 670-1468
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext.2587
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
Virginia	Richmond: James Branch Cabell Library, Virginia Commonwealth University	(804) 367-1104
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Library, University of Wisconsin Madison	(608) 262-6845
	Milwaukee Public Library	(414) 278-3247

PATENT EXAMINING CORPS

JAMES E. DENNY, Acting Assistant Commissioner
STEPHEN G. KUNIN, Acting Deputy Assistant Commissioner

PATENT EXAMINING GROUPS	Phone Number Area Code 703
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director.	308-0661
ORGANIC CHEMISTRY GROUP 120—JOHN F. TERAPANE, JR., Director	308-1235
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP— 130 BARRY S. RICHMAN, Director	308-0651
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	308-2351
BIOTECHNOLOGY, GROUP 180—EDWARD E. KUBASIEWICZ, Director	308-0196
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—D. G. KELLY, Director	308-1782
SPECIAL LAWS ADMINISTRATION, GROUP 220—ROBERT E. GARRETT, Director	308-0511
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—GERALD GOLDBERG, Director	308-0754
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—CARLTON CROYLE Director	308-0771
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—JOSEPH J. ROLLA, Director.	308-0956
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP— 260 STEWART LEVY, Acting Director	308-0962
DESIGN, GROUP 290—ROBERT E. GARRETT, Director	308-0511
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	308-1113
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—N. GODICI, Director	308-1148
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—J. J. LOVE, Director	308-0858
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—JOHN KITTLE, Director	308-0861
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350— A. L. SMITH, Director	308-0651

Expiration of patents: The patents within the range of numbers indicated below expire during March 1991 except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

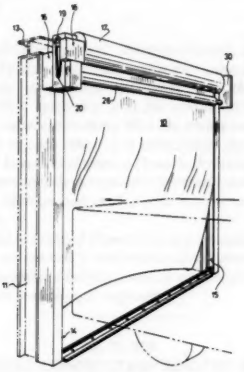
Patents ..... Numbers 3,795,014 to 3,800,328 inclusive
Plant Patents ..... 3,501 to 3,534 inclusive

REEXAMINATIONS

APRIL 23, 1991

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 4,478,268 (1452nd)
DOOR STRUCTURE
Glenn R. Palmer, Toronto, Canada, assignor to M & I Door Systems Limited
Reexamination Request No. 90/002,028, May 17, 1990.
Reexamination Certificate for Patent No. 4,478,268, issued Oct. 23, 1984, Ser. No. 481,277, Apr. 1, 1983.
Continuation of Ser. No. 220719, Dec. 29, 1980, abandoned
Int. Cl.[5] E06B *9/58*
U.S. Cl. 160—310



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–9** is confirmed.

Claims **10** and **11** are determined to be patentable as amended.

Claims **12–14**, dependent on an amended claim, are determined to be patentable.

New claims **15–18** are added and determined to be patentable.

1. A damage-minimizing door comprising:
a flexible curtain having an upper end and a lower end and side edges;
a curtain winding mechanism;
said upper end of said curtain being secured to said winding mechanism for moving said curtain upwards and downwards;
a pair of parallel spaced apart guide channels, said side edges of said curtain being movable in said guide channels, being sealingly engageable therewith under at least atmospheric pressure and being releasable therefrom at a predetermined impact force on said curtain; and,
a rigid bar secured adjacent the lower end of said curtain, said rigid bar being releasably secured to said curtain and releasing therefrom at said predetermined impact force.

B1 4,645,317 (1453rd)
EYEGLASS LENS MODULES AND METHOD
Philip M. Frieder, Miami, and Edward deRojas, Lauderhill, both of Fla., assignors to Optical Systems International, Inc., Hialeah, Fla.
Reexamination Request No. 90/001,579, Aug. 18, 1988.
Reexamination Certificate for Patent No. 4,645,317, issued Feb. 24, 1987, Ser. No. 468,700, Feb. 22, 1983.
Int. Cl.[5] G02C *7/06, 7/08, 7/10*
U.S. Cl. 351—164

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

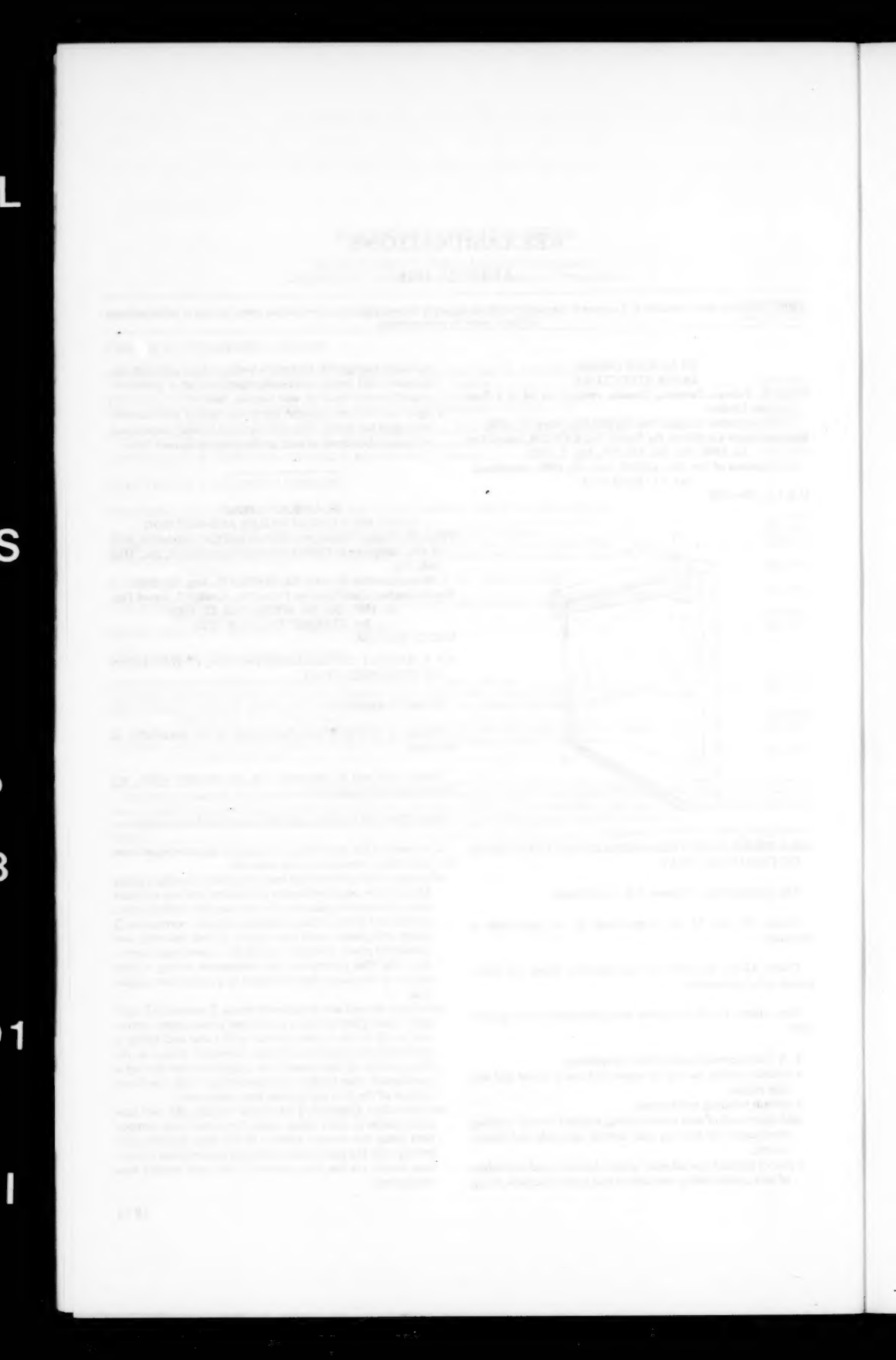
Claim **7** is cancelled.

Claims **1**, **6** and **9** are determined to be patentable as amended.

Claims **2–5** and **8**, dependent on an amended claim, are determined to be patentable.

New Claim **10** is added and determined to be patentable.

1. A method for assembling an eyeglass lens having at least two corrections comprising the steps of:
selecting a first prescription lens component having a given [positive or negative diopter correction, and any cylinder correction prescription on the rear occular surface and a preselected front surface without cylinder corrections,] *ocular side patient total prescription of both spherical and cylindrical power correction except for a presbyopia correction, said first prescription lens component having a front surface to be covered and laminated to a second lens component,*
selecting a second lens component being [essentially] optically plano [but having a performed prescription correction at a] *in the distance portion of the lens and having a preformed presbyopia prescription correction feature at the front* portion of the second lens component and having a preselected rear surface complementary with the front surface of the *first* presciption lens *component,*
and thereafter [optically] *physically* bonding the two lens components to each other, with the second lens component being the exterior portion of the lens, thereby positioning *only* the preformed *presbyopia* prescription correction feature on the *front portion of the* outer second lens component.



REISSUES

APRIL 23, 1991

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 33,574
SUBSTITUTED BIPHENYL DERIVATIVES

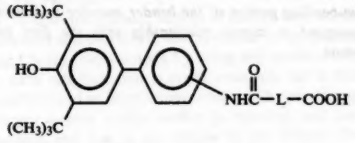
Alan R. Kirk, Cottage Grove, and Robert A. Scherrer, White Bear Lake, both of Minn., assignors to Riker Laboratories, Inc., St. Paul, Minn.

Original No. 4,710,515, dated Dec. 1, 1987, Ser. No. 26,877, Mar. 17, 1987. Application for reissue Jan. 24, 1990, Ser. No. 469,204

Int. Cl.[5] A61K *31/195*

U.S. Cl. 514—563 **13 Claims**

12. An antiallergic pharmaceutical composition comprising a compound of the formula



wherein L is divalent phenyl, straight-chained lower alkylene wherein the alkylene chain may optionally contain an ether or thioether linkage, or divalent cycloalkyl, with the proviso that when L is divalent cycloalkyl and the amide carbonyl and the carboxyl are on adjacent carbons, then the amide carbonyl and the carboxyl are cis to each other; or a carboxylate derivative thereof selected from a lower alkyl ester, a (lower)alkylamino(lower)alkyl ester, a pharmaceutically acceptable (lower)alkylamino(lower)alkyl ester acid addition salt and a pharmaceutically acceptable carboxylate salt,

in a dosage form selected from the group consisting of a tablet, a capsule, an aerosol, a controlled release patch, and a powder, said compound being present in an amount sufficient for providing an antiallergic response.

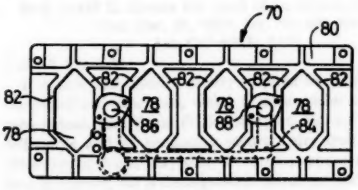
Re. 33,575
INTERNAL COMBUSTION ENGINE NOISE REDUCTION PLATE

Benny Ballheimer, and Michael K. Stratton, both of Peoria, Ill., assignors to Caterpillar Inc., Peoria, Ill.

Original No. 4,771,747, dated Sep. 20, 1988, Ser. No. 134,421, Dec. 17, 1987. Application for reissue Apr. 30, 1990, Ser. No. 516,885

Int. Cl.[5] F02B *77/00;* **F02F** *7/08*

U.S. Cl. 123—198 E **20 Claims**



1. A cylinder block having a pair of elongate, spaced apart sidewalls each defining an outer mounting surface along a lower edge thereof, crankshaft mounting means integral with the block in elevationally upwardly spaced relation to the outer mounting surface and including removable bearing caps the sidewalls further defining inner mounting surfaces elevationally spaced below the bearing caps;

a crankshaft rotatably mounted in the crankshaft mounting means and retained therein by the bearing caps;

an oil pan sealingly and removably connected to the outer mounting surfaces of the sidewalls; and

rigidifying means removably connected to the inner mounting surface, said rigidifying means structurally interconnecting the pair of sidewalls, *said sidewalls having an inner mounting side being in frictional engagement with substantially the entire length of the inner mounting surface* and being free of connection with the bearing caps.

Re. 33,576
COUPLING ASSEMBLY AND FRICTION SHOE THEREFOR

James M. Latsko, North Royalton, Ohio, assignor to Eaton Corporation, Cleveland, Ohio

Original No. 4,795,013, dated Jan. 3, 1989, Ser. No. 40,507, Apr. 20, 1987. Application for reissue Jul. 21, 1989, Ser. No. 384,146

Int. Cl.[5] F16D *25/04, 13/10, 69/04*

U.S. Cl. 192—88 B **14 Claims**

7. A friction shoe for use in a friction coupling which includes an input member, an output member and a fluid inflatable annular tube element having a portion thereof which moves radially to couple and decouple the input and output members, said friction shoe comprising a backing plate having an opening therein, a pad made of friction material secured to one side of said backing plate, a driving bar made of the friction material and disposed on a side of said backing plate opposite from said pad, said friction material extending through said opening in said backing plate and overlying the side of said backing plate opposite from said pad, said pad, driving bar and friction material extending through said opening in said backing plate being formed as one piece to join together said backing plate, pad and driving bar as a unitary structure, said friction shoe having means for use in attaching said friction shoe to the portion of the tube element which moves radially to enable said friction shoe to be attached to the tube element with said driving bar positioned to facilitate torque transfer between said friction shoe and the tube element.

Re. 33,577
ADVANCED PIEZOCERAMIC POWER SWITCHING DEVICES EMPLOYING PROTECTIVE GASTIGHT ENCLOSURE AND METHOD OF MANUFACTURE

John D. Harnden, Jr., Schenectady; William P. Kornrumpf, Albany, and George A. Farrall, Rexford, all of N.Y., assignors to General Electric Company, Fort Wayne, Ind.

Original No. 4,689,517, dated Aug. 25, 1987, Ser. No. 881,525, Jun. 30, 1986. Division of Ser. No. 685,108, Dec. 21, 1984, Pat. No. 4,714,847. Application for reissue Jul. 20, 1989, Ser. No. 383,315

Int. Cl.[5] H01L *41/08*

U.S. Cl. 310—332 **28 Claims**

25. Electrical switching apparatus comprising:

a gastight protective enclosure secured to a base member for supporting the enclosure,

means for sealing the interior of the enclosure in a gastight manner,

at least one piezoelectric bender member having

a bender portion formed by two juxtaposed piezoelectric planar plate elements secured together sandwich fashion, the bender portion having inner and outer conductive surfaces formed on the planar surfaces of the plate elements, and

a non-bending portion adjacent the bender portion, the non-bending portion being electrically isolated from the conductive surfaces,

first terminal means operatively connected to the conductive surfaces for applying electric potentials to the respective plate elements in the bender portion,

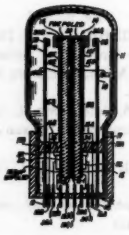
means for clamping the bender member within the enclosure by securing the non-bending portion so that the bender member is physically supported cantilever fashion with the bender portion being movable, the non-bending portion being clamped by the clamping means,

first electric switch contact means within the gastight enclosure mechanically connected to the movable end of the bender portion,

second electric switch contact means physically mounted within the gastight enclosure and selectively engageable by the first electric switch contact menas upon the selective application of an electric potential to a respective one of the piezoelectric plate elements for causing the bender member to bend and close the first and second electric switch contact means to allow electric current flow therethrough,

respective electrically conductive lead means connected to the first and second electric switch contact means and extending to respective second terminal means supported by the base member outside the protective gastight enclosure for selectively supplying electric load current to a load outside the enclosure via the first and second electric switch contact means, and

electric circuit components in the form of passive circuit elements and/or active semiconductor devices supported to said non-bending portion of the bender member and electrically connected in circuit relationship with the first terminal means.



PLANT PATENTS

GRANTED APRIL 23, 1991

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

7,502

CHERRY TREE (AARON GEE)

Norman G. Bradford, 11875 E. Savana Rd., and Lowell G. Bradford, 12439 E. Savana Rd., both of Le Grand, Calif. 95333

Filed Dec. 29, 1989, Ser. No. 459,256
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—37 1 Claim

1. A new and distinct variety of cherry tree, substantially as illustrated and described, that is similar to its grandparent, the Bing Cherry (unpatented), by being self-sterile and by producing dark red fruit that is crack resistant, but is distinguished therefrom and an improvement thereon by producing fruit that is larger in size, 3 days earlier in ripening, and less prone to doubling, and that is also similar to the Tulare Cherry (U.S. Plant Pat. No. 6,407) by producing fruit that is dark red in color, resistant to cracking and doubling, but is distinguished therefrom and an improvement thereon by being more vigorous, more productive, and producing fruit that is much larger in size, 5 days later in maturing, and that has a shorter stem.

7,503

PLUM TREE (PURPLE MAJESTY)

Norman G. Bradford, 11875 E. Savana Rd., and Lowell G. Bradford, 12439 E. Savana Rd., both of Le Grand, Calif. 95333

Filed Dec. 26, 1989, Ser. No. 457,183
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—38 1 Claim

1. A new and distinct variety of plum tree, substantially as illustrated and described, which matures at nearly the same time as Santa Rosa, unpatented, but is distinguished therefrom and an improvement thereon by producing fruit that is larger in size, much firmer in texture, darker in skin color at shipping ripeness, and axially compressed in shape.

7,504

PLUM TREE (BLACK NOBLE)

Norman G. Bradford, 11875 E. Savana Rd., and Lowell G. Bradford, 12439 E. Savana Rd., both of Le Grand, Calif. 95333

Filed Dec. 28, 1989, Ser. No. 458,408
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—38 1 Claim

1. A new and distinct variety of plum tree, substantially as illustrated and described, which is most similar to its selected seed parent, Red Beaut (U.S. Plant Pat. No. 2,539), by being self-sterile and by producing medium size fruit that is very attractive in shape, very shiny in surface appearance, and very firm in texture, but is distinguished therefrom and an improvement thereon by producing fruit that ripens seven days later, that is very dark reddish purple in skin color instead of red, that is red in flesh color instead of yellow, and that is much sweeter in flavor.

7,505

NECTARINE TREE, "LATE RED JIM II"

John W. Tos, Hanford, Calif., assignor to Tos Farms, Inc., Hanford, Calif.

Filed Dec. 26, 1989, Ser. No. 457,159
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—41 1 Claim

1. A new and distinct variety of nectarine tree substantially as illustrated and described and which is somewhat remotely similar to the Red Jim nectarine tree (U.S. Plant Pat. No. 4,518) with which it is most closely similar but from which it is distinguished and characterized principally as to novelty by producing fruit which is mature for commercial harvest and shipment approximately August 30 through September 20 in the San Joaquin Valley of California and which further has noteworthy shipping and handling characteristics.

7,506

NECTARINE TREE (SUMMER FIRE)

Norman G. Bradford, 11875 E. Savana Rd., and Lowell G. Bradford, 12439 E. Savana Rd., both of Le Grand, Calif. 95333

Filed Dec. 26, 1989, Ser. No. 457,232
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—41 1 Claim

1. A new and distinct variety of mid-seasonal ripening clingstone nectarine tree, substantially as illustrated and described, which most nearly resembles the Summer Bright (U.S. Plant Pat. No. 7,049) nectarine variety by producing fruit that is nearly full red in color, clingstone in type, and exceptionally firm in texture, but is distinguished from and an improvement on that variety by producing fruit that is somewhat larger in size and that ripens nine days later, thus extending those desirable qualities into a later harvesting and marketing season.

7,507

NECTARINE TREE (SPRING BRIGHT)

Norman G. Bradford, 11875 E. Savana Rd., and Lowell G. Bradford, 12439 E. Savana Rd., both of Le Grand, Calif. 95333

Filed Dec. 26, 1988, Ser. No. 457,236
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—41 1 Claim

1. A new and distinct variety of clingstone nectarine tree, substantially as illustrated and described, whose fruit matures at nearly the same time as Spring Red (U.S. Plant Pat. No. 3,619), but is distinguished therefrom and an improvement thereon by producing fruit that is darker red in skin color, very much firmer in texture, much sweeter in flavor, and clingstone instead of freestone in type; whose fruit most nearly resembles the May Diamond (U.S. Plant Pat. No. 5,454), the seed parent, by being a full red colored nectarine with excellent firmness, but is distinguished therefrom and an improvement thereon by ripening sixteen days later, by being a clingstone instead of a freestone, and by having a sweeter flavor; and whose tree is distinguished from the May Diamond by producing a large instead of small blossom and by having globose instead of reniform glands.

PATENTS

GRANTED APR. 23, 1991

ERRATA

For CLASS	See PATENT NO.
209-615	5,009,331
209-652	5,009,332
211-013	5,009,333
211-054	5,009,334
211-055	5,009,335
211-086	5,009,336
211-086	5,009,337
215-230	5,009,338
346-138	5,009,509
436-077	5,010,020
436-120	5,010,021
436-123	5,010,022
548-267	5,010,208
318-116	5,010,222
315-384	5,010,284
324-173	5,010,290
341-065	5,010,344
341-065	5,010,345
341-137	5,010,346
341-143	5,010,347
369-077	5,010,484

PATENTS

GRANTED APRIL 23, 1991

GENERAL AND MECHANICAL

5,008,959

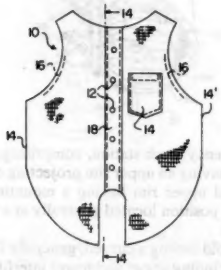
BULLETPROOF DRESS SHIRT

Edward A. Coppage, Jr., 3031 Borge St., Unit 109, Oakton, Va. 22124, and Richard W. Coppage, 14607 Batavia Dr., Centreville, Va. 22020

Filed Feb. 28, 1990, Ser. No. 486,374

Int. Cl.[5] F41H *1/00*; A41D *13/00, 1/04*

U.S. Cl. 2—2.5 **16 Claims**



1. A bulletproof shirt comprising: a front panel and a rear panel and connecting means releasably attaching said front panel to said rear panel;

said front panel including:

(a) an outer layer including means incorporated thereon causing said outer layer to resemble a shirt;

(b) a middle layer including a portion of said connecting means;

(c) an inner layer including a first opening bounded by first and second means releasably fastening said opening in a closed configuration;

(d) said outer layer being permanently fastened to said middle layer at one location and said middle layer being permanently fastened to said inner layer to form a front panel containment area between said inner and middle layers accessible through said first opening;

said rear panel including:

(a) an outer layer including a portion of said connecting means and further including third releasable fastening means;

(b) an inner layer including fourth releasable fastening means engageable by said third releasable fastening means;

(c) said inner and outer layers of said rear panel being permanently fastened together so that said third and fourth releasable fastening means engage one another and provide closable access to a rear panel containment area formed between said layers;

said inner layers of said front and rear panel comprising a bi-component fabric having hydrophobic and hydrophilic capabilities;

said shirt further including removable bulletproof pads,

a first said pad being removably inserted into said front panel containment area and a second said pad being removably inserted into said rear panel containment area; said pads each comprising a series of layers of woven and non-woven ultrahigh molecular weight extended chain polyethylene material, said woven layers comprising fibers of from 185 denier to 500 denier and said non-woven layers being unidirectional pads;

said front and rear panels being assembled to one another by engagement of said connecting means in said panels.

5,008,960

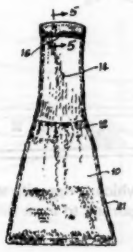
NURSING GARMENT

Valda K. Hemming, 13329 Canyon Back Lane, Poway, Calif. 92064

Filed Jun. 15, 1990, Ser. No. 538,553

Int. Cl.[5] A41D *1/20, 1/22*

U.S. Cl. 2—104 **1 Claim**



1. A nursing garment to cover the breast of a woman while nursing a baby, comprising:

(a) an absorbent upper portion for lying over the shoulder of a nursing woman;

(b) retaining means connected to the upper end of said absorbent portion for retaining same in place over the shoulder of the woman;

(c) an expanded lower portion connected to said upper portion to flair out to cover both the breast of the woman and at least a portion of the nursing baby;

(d) said upper portion and said lower portion being integrally knit, with said upper portion being close-knit and absorbent for burping the baby thereon and said lower portion expanding into a loose, open knit to provide adequate ventilation for the baby;

(e) said retaining means comprising weight means weighing on the order of two ounces sewn into the upper edge of said upper portion and being padded to provide a soft contact for the woman and baby.

5,008,961

SANITARY HEAD COVERING AND METHOD OF MANUFACTURE

Vance M. Hubbard, and Welton K. Brunson, both of Bedford, Tex., assignors to Tecnol, Inc., N. Richland Hills, Tex.

Filed Jul. 20, 1989, Ser. No. 382,259

Int. Cl.[5] A42B *1/02, 1/04*

U.S. Cl. 2—195 **11 Claims**

1. A method for forming a sanitary head covering, comprising the steps of:

adhering a first upper edge of an expandable crown portion to a second upper edge of an elongated flexible sheet;

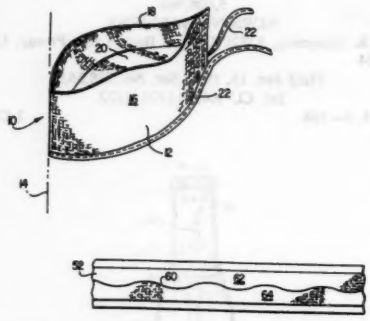
securing ties to said elongated sheet to enable attachment of the head covering to the head of a wearer;

folding said elongated sheet and said crown portion in half about a transverse axis to form a first and a second side portion;

adhering a first lower edge of said crown portion of said first side portion to a second lower edge of said crown portion of said second side portion; and

adhering a first corner on said upper edge of said elongated

sheet which is opposite said transverse axis on said first side portion to a second corner on said upper edge of said



elongated sheet which is opposite said transverse axis on said second side portion to form the headcovering.

5,008,962

EASY TO FASTEN TROUSERS

Lynn U. Smith, 6939 Reynolds St., Pittsburgh, Pa. 15208, and Mario J. Merlino, Moscow, Pa., assignors to Lynn U. Smith, Pittsburgh, Pa.

Filed Feb. 8, 1990, Ser. No. 476,772
Int. Cl.[5] A41D *1/06*
U.S. Cl. 2—234 **9 Claims**

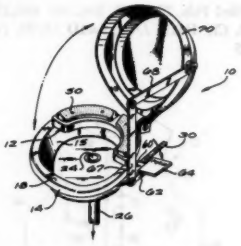
1. In trousers having an upper edge, a pelvic sheath, and two adjacent legs each having an outseam, an inseam and a hem edge, the improvement comprising two selectively openable seams, each of said selectively openable seams extending down the front portion of its own respective trouser leg from said upper edge to one of said hem edges, with each of said selectively openable seams being positioned at said upper edge at a horizontal position between the respective adjacent outseam and respective adjacent inseam of said trouser leg and tapering diagonally away from said outseam and into the area of said respective adjacent inseam.

5,008,963

EMERGENCY WASH STATION

Matthew I. Stein, Truckee, Calif., assignor to Haws Company, Sparks, Nev.

Filed Jul. 3, 1989, Ser. No. 375,121
Int. Cl.[5] A61H *33/00*
U.S. Cl. 4—620 **18 Claims**



10. An emergency wash station, comprising:

a drain bowl having an upper rim projecting outwardly from a basin, said upper rim having a mounting port formed therein at a position located generally at a rear side of the drain bowl;

a spray manifold having a curved, generally C-shaped geometry and including upper and lower interfitting and generally shell-shaped manifold members cooperatively defining a manifold chamber extending generally in opposite directions from an inlet fitting adapted for passage of water into the manifold chamber, said upper manifold member of said spray manifold further defining a relatively large plurality of generally upwardly open spray ports for passage of water upwardly from said manifold chamber as a plurality of small water streams;

means for mounting said inlet fitting to said upper rim with said inlet fitting projecting through said mounting port and with said spray ports of said spray manifold each located a substantial distance above said upper rim, said spray manifold extending from said inlet fitting to laterally opposite sides of the drain bowl;

means for connecting a water supply pipe to said inlet fitting; and

valve means mounted in-line with said water supply pipe and normally closed to prevent water flow to said manifold chamber, said valve means being movable to an open position to permit water flow to said manifold chamber.

5,008,964

CHILD'S TOILET

Janet C. Dean, R.R. 3, Box 120, Spencer, Iowa 51301, and Terry B. Dean, Mountain View, Calif., assignors to Janet C. Dean, Spencer, Iowa

Filed Feb. 9, 1990, Ser. No. 477,465
Int. Cl.[5] A47K *11/04*; A61G *9/00*
U.S. Cl. 4—661 **6 Claims**

1. A music and speech generating potty chair with a removable waste receptor and a seat used to toilet train a child, comprising:

(a) a pressure sensitive switch between the seat and the chair adapted to close when the child sits on the seat;

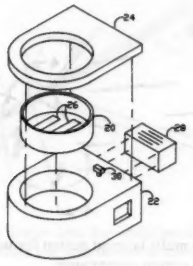
(b) a waste moisture sensing circuit with a sensor mounted in the bottom of the receptor adapted to generate a detection signal upon sensing bodily waste introduced into the receptor;

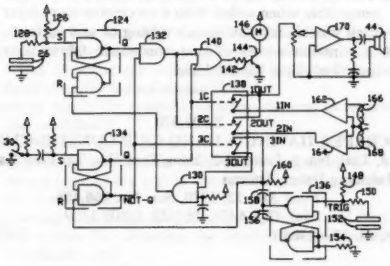
(c) a timing and control circuit responsive to the switch being closed and the detection signal adapted to produce control signals and the clock pulses;

(d) a data storage circuit responsive to the control signals and the clock pulses containing musical sound data and speech message data;

(e) a tune generating circuit responsive to the control signals and the clock pulses and being adapted to access the musical sound data from the data storage circuit and convert the musical sound data into musical sounds when the switch is closed by the child sitting on the chair to thereby require less parental supervision and entertain the child while on the chair;

(f) a speech generating circuit responsive to the control signals and clock pulses and being adapted to access the





speech message data from the data storage circuit and convert the speech message data into speech sounds when the detection signal is generated by the child excreting bodily waste into the receptor to thereby congratulate the child when the child excretes bodily waste while on the chair; and

(g) an amplifier circuit with a loudspeaker coupled to the tune generating circuit to amplify and audibly produce the musical sounds and coupled to the speech generating circuit to amplify and audibly produce the speech sounds.

5,008,965

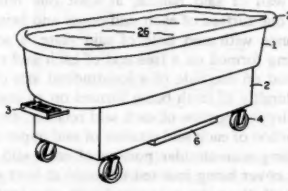
FLUIDIZED BEAD BED

John H. Vrzalik, San Antonio, Tex., assignor to Kinetic Concepts, Inc., San Antonio, Tex.

Filed Jul. 11, 1988, Ser. No. 217,685

Int. Cl.[5] A61G 7/00

U.S. Cl. 5—61 **47 Claims**



47. A method of supporting a patient on a fluidized patient support apparatus of the type comprising a tank containing a mass of granular material covered by a sheet which serves to support a patient comprising the steps of:

alternately inflating opposed bladders in the granular material to turn the patient from side to side.

5,008,966

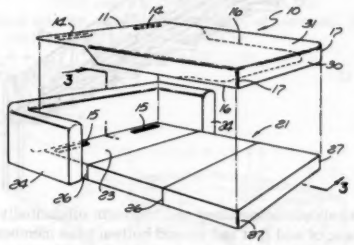
SHEET FOR FOAM SOFA BED

Joyce Lepow, 1321A E. Allen Rd., Tucson, Ariz. 85719

Filed Mar. 8, 1990, Ser. No. 490,379

Int. Cl.[5] A47G 9/04

U.S. Cl. 5—496 **8 Claims**



1. A bed sheet comprising:

a first substantially rectangular piece of fabric said first piece of fabric having top and bottom edges and first and second side edges;

a second piece of fabric coupled to said first piece of fabric only along a portion of said first and second side edges and said bottom edge of said first piece of fabric, sao as to form a peripheral border, only partially surrounding the perimeter of said first piece of fabric;

an elastic member, said elastic member being coupled to an outside edge of said peripheral border;

attachment means coupled to a bottom side of said first piece of fabric and disposed substantially adjacent to said top edge of said first piece of fabric whereby the bed sheet at the area adjacent the top edge of said first sheet of fabric is substantially free of downwardly extending border elements, thereby facilitating the attachment of the attachment means on said first piece of fabric to matting attachment means on a foldable mattress that has one of its end portions and at least a part of its side edges surrounded by the back and arms of a sofa bed.

5,008,967

TRIANGULAR TRUSS WALKOUT CANTILEVER

Richard C. Barrios, and Philip A. Hayes, both of Louisville, Ky., assignors to Modern Industries, Inc., Louisville, Ky.

Filed Jul. 13, 1989, Ser. No. 379,551

Int. Cl.[5] B61L 5/12; E04C 3/02; E04H 12/10

U.S. Cl. 14—7 **4 Claims**

1. In a railroad warning system, a walkout cantilever comprising:

a base adapted to overlie a supporting pad;

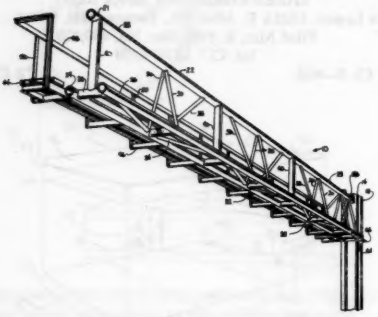
an upright mast having a bottom end fixed to said base;

a horizontally disposed truss arm secured to and extending from said mast and including three longitudinal truss members disposed substantially parallel to one another, said truss members comprising a first bottom truss member, a second bottom truss member and a top truss member presenting a cross sectional triangular pattern having a horizontal base and an upwardly projecting apex;

means interlocking said longitudinal truss members, including a plurality of spaced cross members disposed essentially in the plane of said first and second bottom truss members and joined thereto, a vertical brace attached to and extending from a corresponding cross member to said

top truss member, and two pairs of side braces spaced from said vertical brace in opposite longitudinal directions and extending to said top truss member from said first and second bottom truss members;

a signal light unit mounted on said vertical brace;



a catwalk extending along said truss arm substantially in the plane of said first and second bottom truss members; and

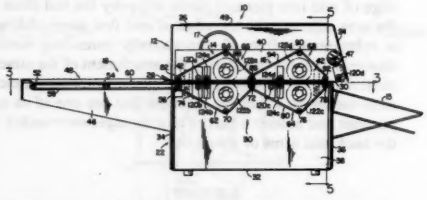
means securing said catwalk to one of said bottom truss members.

5,008,968

SHEET MATERIAL CLEANING MACHINE

Wallace Preston, West Springfield, Mass., assignor to Markel Industries, Inc., Enfield, Conn. and Julie Associates, Inc., North Billerica, Mass.

Filed Jul. 27, 1989, Ser. No. 386,429
Int. Cl.[5] B08B *6/00*
U.S. Cl. 15—1.51 **22 Claims**



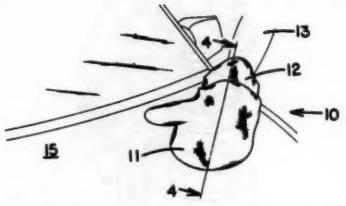
1. Sheet material cleaning machine comprising cleaning means for removing particulate matter from at least one surface of a sheet to be cleaned and including first and second cleaning stations and cleaning apparatus at each of said cleaning stations, and conveying means for positively driving a sheet such as aforesaid along a predetermined generally longitudinally extending path through said cleaning stations, said conveying means occluding a portion of the one surface of the sheet as the sheet is advanced through said first cleaning station and exposing the previously occluded portion of the one surface of the sheet to said cleaning apparatus at said second cleaning station as the sheet is further advanced through said second cleaning station, said conveying means including a first conveyor section for driving the sheet through said first cleaning station and a second conveyor section generally continuous to said first conveyor section for driving the sheet through said second cleaning station, each of said conveyor sections having a plurality of transversely spaced apart sheet engaging elements including upper sheet engaging elements for engaging the upper surface of the sheet and lower sheet engaging elements for engaging the lower surface of the sheet, said sheet engaging elements of said second conveyor section being transversely offset relative to said sheet engaging elements of said first conveyor section.

5,008,969

SEPARABLE MULTI-LAYERED WIPING MITTEN

Guy R. Jarrett, 2013 College Ave., Modesto, Calif. 95350

Filed Jul. 23, 1990, Ser. No. 556,355
Int. Cl.[5] A47L *13/18*
U.S. Cl. 15—227 **3 Claims**



1. A separable multi-layered mitten for wiping surfaces prior to painting, said mitten comprising:

A. at least two concentric fabric layers, the outer said layer removable when soiled from a successive inner layer then itself useable for contineous wiping of said surface;

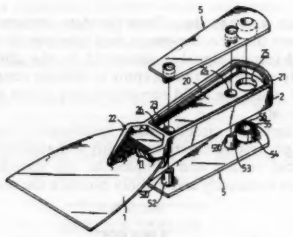
B. a common center of said concentric fabric layers for insertion of the human hand.

5,008,970

SCRAPER HAVING A HAND GRIP CONSTRUCTION

Su J. Tsai, No. 1, Lane 15-2, Yung Feng Rd., Tai Ping Hsiang, Taichung Hsien, Taiwan

Filed Jan. 22, 1990, Ser. No. 468,159
Int. Cl.[5] A47L *13/022;* B26B *3/00*
U.S. Cl. 15—236.01 **3 Claims**



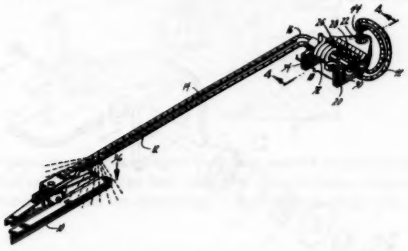
1. A scraper comprising a blade being fixed in a front end of a handle; said handle substantially comprising a plate, an outer perimeter wall being respectively formed on an upper surface and a lower surface of said plate, at least one hole being formed in said plate; an upper cover and a lower cover having a shape corresponding to that of said handle and being respectively provided on an upper surface and a lower surface of said outer perimeter wall of said handle, at least one retainer being formed on one surface of each said cover and being arranged in accordance with said hole of said plate, a semi-circular portion being formed on a free end of each said retainer and being located on one side of a longitudinal axis of each said cover, a plurality of teeth being formed on an end surface of said semi-circular portion of each said retainer, and said semi-circular portion of each said retainer of said upper cover and a corresponding semi-circular portion of each said retainer of said lower cover being inserted into said at least one hole so that said teeth thereof are engaged with one another and so that said covers are clamped together in order to form a smooth outer surface for said handle.

5,008,971

WINDSHIELD WIPER ARM

Kenneth W. Stewart, Sr., Columbus, Miss., assignor to United Technologies Electro Systems, Inc., Columbus, Miss.

Filed Oct. 20, 1989, Ser. No. 424,487
Int. Cl.[5] B60S 1/34
U.S. Cl. 15—250.2 5 Claims



1. A windshield wiper arm for attachment to a wiper arm drive shaft that rotates the arm on a windshield, characterized by:

a wiper arm carrier adapted to fit on the wiper arm drive shaft;

a rod which is rotatably mounted on the carrier and rotatable on the carrier between a first position for causing the wiper to strike the windshield and a second position a fixed distance from the windshield;

resilient means for rotatably holding the rod in tension on the windshield;

detent means on the carrier;

detent engagement means on the rod for engaging the detent means to hold the rod in the second position away from the windshield;

tensioning means engaging the carrier, the rod and the resilient means for adjusting the tension of the rod on the windshield, and

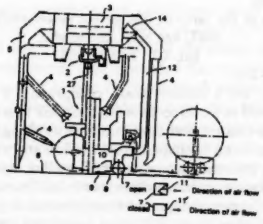
the resilient means forcing the detent engagement means into the detent.

5,008,972

CLEANING DEVICE FOR TEXTILE MACHINES DISPOSED IN A ROW

Ulrich Steinike, Augsburg, Fed. Rep. of Germany, assignor to Ernst Jacobi & Co. KG, Augsburg, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 215,382, Jul. 5, 1988, abandoned. This application Jun. 18, 1990, Ser. No. 539,556
Claims priority, application Fed. Rep. of Germany, Sep. 18, 1987, 3731449
Int. Cl.[5] D01G 15/76
U.S. Cl. 15—312.2 22 Claims



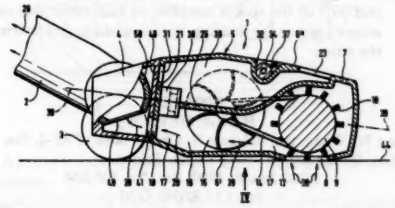
1. A cleaning device for textile machines disposed in a row, comprising a cleaning apparatus for movement back and forth above said machines including blow hoses provided with nozzles for blowing off loose fuzz and at least one suction hose for sucking up the blown off fuzz, at least one stationary blowing means disposed at a side of each machine opposite the suction hose, the blowing means having at least one blast nozzle for blowing air so as to cover the floor below the textile machine, the cleaning apparatus having a vertically extending, substantially rigid air blast duct for docking at the blowing means when the cleaning apparatus is aligned with the blowing means.

5,008,973

MULTI-PURPOSE SUCTION NOZZLE

Peter Wörwag, Romanshorn, Switzerland, assignor to Düpro AG, Romanshorn, Switzerland

Filed Jan. 31, 1990, Ser. No. 473,283
Claims priority, application Fed. Rep. of Germany, Jan. 31, 1989, 3902741; Jan. 9, 1990, 4000374
Int. Cl.[5] A47L 5/36
U.S. Cl. 15—416 12 Claims



1. A multi-purpose suction nozzle, for a vacuum cleaner, for cleaning different types of surfaces, such as hard smooth surfaces, textile floor coverings, and upholstery, whereby said suction nozzle is detachably connected to a suction line of said vacuum cleaner via a pivotably mounted connector, said suction nozzle comprising:

a housing having a first suction opening that communicates with a first flow channel, and a second suction opening about which are provided planar slide surfaces and which communicates with a second flow channel, with said housing essentially comprising a rear nozzle portion that is connected to said connector, and a front nozzle portion that is provided with said first and second suction openings, and in which said housing essentially has a low design with two oppositely disposed sides, each of which is provided with one of said suction openings; a partition is disposed between said first and second flow channels, whereby for said selective use of one of said suction openings, said front nozzle portion is rotatable relative to said rear nozzle portion in such a way that one of said sides of said housing, along with the associated suction opening, comes to rest on the floor surface that is to be cleaned;

a brush that is rotatably mounted in said housing in such a way that bristles of said brush extend through said first suction opening; and

means for selectively connecting either said first flow channel or said second flow channel with said connector.

5,008,974

CARRYING HANDLE ASSEMBLY

Randall N. Eilert, Lake Stevens; Robert M. Neel, Woodinville; N. Thatcher Harvey; Wilbur R. Ames, IV, both of Lake Stevens, and Randall D. Lord, Everett, all of Wash., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Apr. 28, 1989, Ser. No. 345,324
Int. Cl.[5] A47B 95/02
U.S. Cl. 16—114 R 3 Claims

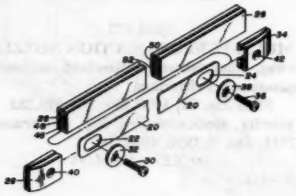
1. A removable carrying handle comprising:

a strap having a slot formed through each end thereof;

an attachment means associated with each end of the strap, each attachment means comprising

a headed fastener having a shaft;

a spacer member having a first part that retains the fastener head on one side of the strap, and a second part that protrudes through the slot to the other side of the strap, the spacer member being configured to engage the fastener with the fastener shaft extending through the slot; and



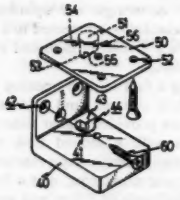
a housing configured for locking engagement with the second part of the spacer member on said other side of the strap to secure the housing, spacer member and fastener to the strap.

5,008,975

HINGE DEVICE

Rong W. Wang, and Johnson S. Chang, both of 9F-1, No. 197, Sec. 4, Nan King E. Rd., Taipei, Taiwan

Filed Jun. 8, 1990, Ser. No. 535,064
Int. Cl.[5] E05D *7/10*
U.S. Cl. 16—266 **2 Claims**



1. A hinge device for mounting a door to a door frame comprising:

(a) a first assembly including an upper door frame plate for attachment to a door frame and an upper door plate for attachment to a top surface of a door, the upper door frame plate having an axle hole formed in a corner thereof, the upper door plate having an axle extending outwardly from a top surface thereof, the axle being engageable within the axle hole to define an axis about which the upper door plate pivots relative to the upper door frame plate; and

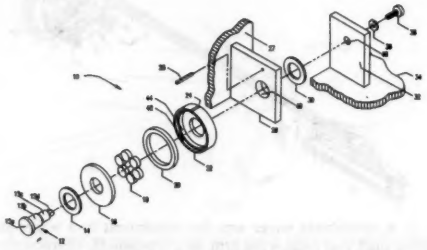
(b) a second assembly including a lower door frame plate for attachment to the door frame and a lower door plate for attachment to a bottom surface of the door, the lower door plate having a protrusion axle extending outwardly from a bottom surface thereof, the protrusion axle being defined by a shaft, first and second recesses, a flange positioned between the recesses, and the first recess being deeper than the second recess, the lower door frame plate having a third recess formed therein, the third recess being defined by a notched blind hole, an alley extending from the blind hole, a wedge, and a convex protrusion extending outwardly from a bottom surface of the blind hole, the flange of the lower door plate being disposable within the alley and blind hole to position the shaft within the blind hole and define a pivot axis therewith, and the flange being disposable between the wedge and the convex protrusion for stabilizing the door in an open position.

5,008,976

DIGITAL APPARATUS HAVING A DISPLAY SECTION ADJUSTED BY A HINGE ASSEMBLY WITH ROLLING RESISTANCE

John P. Busch, Austin, Tex., assignor to Dell Corporate Services Corporation, Austin, Tex.

Filed Mar. 3, 1989, Ser. No. 318,575
Int. Cl.[5] E05D *11/04*; E05C *17/64*
U.S. Cl. 16—276 **19 Claims**



1. A hinge assembly for rotation between a fully closed position and a fully opened position comprising:

(a) a first bracket having an opening therethrough;

(b) a second bracket having an opening therethrough, the opening of the first bracket and the opening of the second bracket being axially aligned;

(c) a shaft extending through the openings in the first and second brackets, respectively, the shaft and the opening in the second bracket being configured to prevent rotation therebetween; and

(d) an elastic roller mechanism surrounding the shaft and having means for engaging one of the first or second brackets to provide any desired fixed position between the first and second brackets when a rotational force is selectively impressed therebetween and selectively removed therefrom, the mechanism including:

a cylindrical retainer having an inner retaining surface and a central opening through which the shaft passes,

a plurality of cylindrical rollers, and

elastic means, retained between the shaft and the inner retaining surface, the plurality of rollers surrounding the shaft and positioned to press into the elastic means.

5,008,977

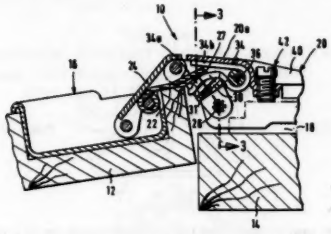
CABINET HINGE WITH CLOSING MECHANISM

Karl Lautenschläger, Reinheim, and Gerhard W. Lautenschläger, Brensbach, both of Fed. Rep. of Germany, assignors to Karl Lautenschläger GmbH & Co. KG, Reinheim, Fed. Rep. of Germany

Filed Apr. 4, 1990, Ser. No. 504,345
Claims priority, application Fed. Rep. of Germany, Apr. 18, 1989, 3912630
The portion of the term of this patent subsequent to Jan. 23, 2007, has been disclaimed.
Int. Cl.[5] E05F *1/08*
U.S. Cl. 16—278 **9 Claims**

1. A hinge for a cabinet door, comprising: a door-related part configured as a cup to be set in the back of a cabinet door, and a carcass-related part configured as an elongated supporting arm of inverted U-shaped cross section and to be mounted on a cabinet; an inner and an outer hinge link articulating said two parts relative to one another, each link having a first end journaled in the cup and a second end journaled at the supporting arm, said inner hinge link being nearer the cabinet interior when the door has been articulated to the closed position; a closing mechanism having a cam element disposed in an end portion of said inner link adjacent said supporting arm, said cam element having a cam surface; a substantially U-shaped leaf spring having a first, flexible leg lying with bias on said

cam surface, having a second leg supported in an interior portion of said supporting arm, and also having a bridging section connecting said two legs; said inner hinge link having



two parallel ears spaced apart from one another at said second end of said inner hinge link; said cam element being disposed between said ears for corotation with said inner hinge link.

5,008,978

APPARATUS FOR TREATING COTTON CONTAMINATED WITH HONEYDEW

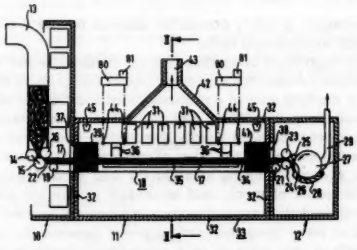
René Waeber; Fritz Knabenhans, and Othmar Bachmann, all of Winterthur, Switzerland, assignors to Maschinenfabrik Rieter AG, Winterthur, Switzerland

Division of Ser. No. 359,495, May 31, 1989. This application Apr. 2, 1990, Ser. No. 503,524

Claims priority, application Switzerland, Jun. 3, 1988, 2121/88

Int. Cl.[5] D01G *9/00, 37/00*

U.S. Cl. 19—66 CC **18 Claims**



1. An apparatus for treating cotton flocks contaminated with honeydew, by the supply of heat, comprising:

a housing provided with a roof;

a substantially tunnel-shaped microwave oven arranged in said housing and provided with an inlet and an outlet;

a conveyor belt made of material absorbing at most relatively little energy and provided for conveying a compressed web of cotton flocks through said tunnel-shaped microwave oven in a predetermined direction;

two delivery rolls arranged at said inlet of said tunnel-shaped microwave oven for forming the cotton flocks into said compressed cotton flock web and two delivery rolls at said outlet of said tunnel-shaped microwave oven for supplying said web toward an opening unit;

said conveyor belt being guided around two deflection rolls, one at said inlet and one at said outlet of said tunnel-shaped microwave oven; and

said roof of said housing of said tunnel-shaped microwave oven being structured as an extraction hood.

5,008,979

TEXTILE-FIBER TREATING GROOVED ROLLER AND A WIRE WITH TEETH HAVING A FOOT PORTION INDENTED FOR FORCE-FITTING THE WIRE INTO THE GROOVE AND METHOD OF MAKING SAME

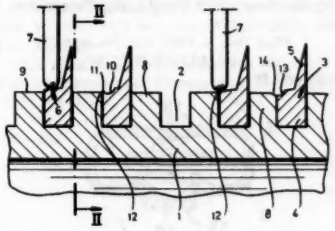
Gangolf Palm, Wegberg; Karl-Heinz Lehmann, and Hans-Joachim Heinemann, both of Mettmann, all of Fed. Rep. of Germany, assignors to Peter Wolters AG, Rendsburg, Fed. Rep. of Germany

Filed Apr. 13, 1989, Ser. No. 337,384

Claims priority, application Fed. Rep. of Germany, Apr. 13, 1988, 3812247

Int. Cl.[5] D01G *15/18, 15/46;* **B21B** *27/02*

U.S. Cl. 19—97 **8 Claims**



1. A roller for the treatment of a textile-fiber mass, the roller comprising:

a steel roller body having a generally cylindrical periphery formed with at least one generally helical outwardly open groove of generally rectangular configuration and having a pair of opposing flanks and a bottom; and

a wire having

a foot portion received in and filling said groove and of generally rectangular cross section, and

a succession of teeth in a sawtooth configuration projecting outward from said foot portion and formed unitarily therewith over substantially the entire length of said wire, said foot portion being indented so as to be deformed to force fit the foot portion in said groove against said flanks.

5,008,980

CLOSURE CLIP, ESPECIALLY FOR THE CLOSURE OF BAGS AND A METHOD AND MACHINE FOR APPLYING THE SAME

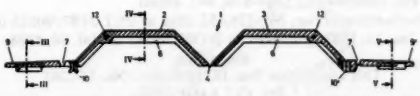
Arnold Zimmermann, 9, chemin des Chênes, 2072 St.-Blaise, Switzerland

Filed Aug. 24, 1989, Ser. No. 398,223

Claims priority, application Switzerland, Aug. 30, 1988, 3226/88

Int. Cl.[5] B65D *63/00*

U.S. Cl. 24—30.5 R **14 Claims**



1. A closure clip, especially for the closure of bags, comprising a base member with a first and a second leg of plastic material, each of said legs forming a rigid structure having a hinge end and a coupling end portion, said first and second legs being hingedly connected at their hinge ends and provided with first and second snap coupling means, respectively, at their coupling end portions, said coupling end portions with their first and second snap coupling means respectively being integral to said rigid structure of the respective leg whereas

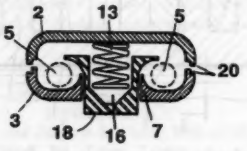
said first and second snap coupling means are manually engageable to each other and manually releasable from each other only by swivelling said legs about their hingedly connected ends, wherein each leg at its coupling end portion is provided with a tongue member extending from said coupling end portion into a direction substantially opposite to said hinge end of the respective leg, each of said tongue members being connected to the respective coupling end portion by means of a web forming a breaking point and wherein said tongue members in a closed state are undetachably connected to each other and are detachable together from said coupling end portions at said breaking point.

5,008,981

ENCLOSED YOKE CLASP FOR BOLA-STYLE NECKTIE

Joseph P. Smithson, 4020 Douglas St., Farmington, N. Mex. 87401

Filed Dec. 1, 1989, Ser. No. 444,758
Int. Cl.[5] A41D *25/04*
U.S. Cl. 24—49 R **4 Claims**



1. A clasp for holding two cords in generally side-by-side relationship comprising: a hollow shell, a portion of said shell having an integral raised structure defining inside of said raised structure an inner surface forming a central annular opening in said shell portion and having on the outside of said raised structure away from said opening a pair of smooth-surfaced concave channels on opposite sides of the opening, a clamp member having a hollow manually engageable actuating portion extending through said opening, said clamp member having exterior smooth-surfaced splayed cord gripping portions overlying the concave channels, means including a compression spring having one end extending into the hollow actuating portion of the clamp member for resiliently biasing said clamp member to urge said splayed portions toward said channels to grip a cord in each of the channels, and means including a second shell portion overlying said first shell portion for securing both shell portions, said clamp member and said biasing means in an assembled relationship when no cords are in said channels, said shell portions being secured together at their periphery to form a hollow shell, said shell having apertures at the periphery of the shell portions where the cords can enter and leave the clasp, said apertures being located to permit alignment of the cords with said channels, said spring being located between said second shell portion and said clamp member.

5,008,982

CLIP

Tatsusabu Tsukamoto, No.2570 Ohaza Mukaizima, Chiyodamachi, Kanazakigun Saga-Ken, 842, Japan

Continuation of Ser. No. 276,452, filed as PCT JP87/00025 on Jan. 16, 1987, published as WO88/05388 on Jul. 28, 1988, abandoned.
This application Sep. 18, 1990, Ser. No. 584,361
Int. Cl.[5] A44B *1/04*
U.S. Cl. 24—67.9 **20 Claims**

1. A clip comprising:

a first clamping member having a first leg and a second leg, the first leg and the second leg being connected at one end;

a second clamping member having a first leg and a second leg, the first leg and the second leg being connected at one end and diverging therefrom;

said first clamping member and said second clamping member being connected, said second clamping member superposed on said first clamping member to form a clip; and

at least one of the legs of said first clamping member overlapping the respective leg of said second clamping member, said at least one leg terminating short of a respective end of said respective leg of said second clamping member and defining an acute angle therewith for allowing facile superpositioning of the second clamping member on the first clamping member.

5,008,983

PORTABLE CLEAT

Ralph C. Heins, 1313 E. Bayview Dr., Tempe, Ariz. 85283

Filed Dec. 18, 1989, Ser. No. 451,801
Int. Cl.[5] A44B *1/04*
U.S. Cl. 24—131 C **6 Claims**

1. A portable cleat adapted for use in rigging and securing objects with a line, said portable cleat comprising in combination:

an elongate primary connector element having a principal axis and opposed ends;

a first secondary connector element rigidly attached to said primary connector element at one of said primary connector element ends at a predetermined location on said first secondary connector element and a second secondary connector element rigidly attached to said primary connector element at the other of said primary connector ends at a predetermined location on said second secondary connector element, said secondary connector elements each including arms extending in generally opposed directions away from the predetermined location thereof and each of said arms of each secondary connector element having a distal end spaced from the distal end of said other arm thereof, said arms being angularly disposed relative to said primary connector element principal axis whereby one of the arms of each secondary connector element defines an acute angle with said principal axis adjacent to said predetermined location and the other of the arms of each secondary connector element defines an obtuse angle with said principal axis adjacent to said predetermined location, one of said secondary connector elements being engageable by said line adjacent the predetermined location thereof and about the arm thereof defining an obtuse angle with said principal axis, said portable cleat and said line cooperable to exert a pulling force at the other of said secondary connector elements when said line is looped about the arm engaged thereby and pulled taut and away from said other secondary connector element, said secondary connector element arms being angularly disposed relative to said primary connector element principal axis with the defined acute angles both being on one side of the primary connector element principal axis and the defined

obtuse angles being on an opposed side of the primary connector element principal axis whereby arms generally converge on said one side and generally diverge on said generally opposed side.

5,008,984

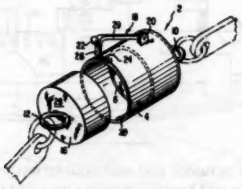
MAGNETIC JEWELRY CLOSURE WITH CLIP

Davida Levy, 1340 Biscaya Dr., Surfside, Fla. 33154

Filed Jun. 12, 1990, Ser. No. 536,777

Int. Cl.[5] A44B *11/25*

U.S. Cl. 24—303 **12 Claims**



1. A jewelry closure comprising:

first and second closure members for engaging together wherein at least one of said closure members comprises a magnet;

casing means for supporting said first closure member and extending outwardly for supporting said second closure member; and

means located on said casing means for engaging adjacent an outer end surface of said second closure member when said second closure member is held by magnetic attraction to said first closure member, said engaging means comprising an elongated member having a first end hinged to said casing means and a second end which lies adjacent said outer end surface of said second closure member when said jewelry closure is in secured position, wherein said hinged means is engaged with a protrusion on said casing means when said jewelry closure is in secured position;

whereby said closure members cannot be separated from magnetic engagement with each other until after said engaging means is released from its position adjacent said second closure member.

5,008,985

ZIPPER SECURING DEVICE

Allister W. Thompson, #1105-1100 Harwood St., Vancouver, B.C., Canada V6E-1R7

Filed Dec. 15, 1987, Ser. No. 133,871

Int. Cl.[5] A44B *19/26, 13/00*

U.S. Cl. 24—370 **1 Claim**

1. An integral one piece zipper pull tab securing device comprising; a circular clip 1 open at one end thereof which can be sprung around a button as a means of attaching said securing device to the material in which the zipper is fitted and a hook means connected to the other end thereof for engagement with the zipper pull tab for securing the zipper in the closed position, a tapered flat connecting member as a means for joining the circular clip 1 to the hook means, an eyelet means in said connecting member for connecting said member to the material in which the zipper is fitted by sewing and a transverse indentation means extending across the outer surface of said connecting member and located adjacent to the buttton engaging clip 1 providing a weakened area to allow a means of seperation between the circular clip 1 and the connecting member, said connecting member being of sufficient length so that said clip 1 can be engaged with said button when the zipper is in the closed position.

5,008,986

SLIDE FASTENER FOR CLOTHING AND SHOES

Jean-Luc Laudet, Poisy, and Pierre Rullier, Annecy, both of France, assignors to Salomon S.A., Annecy Cedex, France

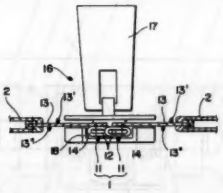
PCT No. PCT/FR89/00302, § 371 Date Feb. 9, 1990, § 102(e) Date Feb. 9, 1990, PCT Pub. No. WO89/12408, PCT Pub. Date Dec. 28, 1989

PCT Filed Jun. 15, 1989, Ser. No. 460,971

Claims priority, application France, May 12, 1989, 89 06753; Jun. 17, 1989, 88 08405

Int. Cl.[5] A44B *19/32*

U.S. Cl. 24—289 **14 Claims**



1. A slide fastener for uniting edges of two elements in a sealing relationship, each said element including an interior and exterior side, said slide fastener comprising:

(a) two support tapes, each support tape being on a respective element, each support tape having an interior and exterior side and a respective border;

(b) two chains of teeth, each chain of teeth being connected only to the interior side of a respective support tape; and

(c) a slide including a linkage tunnel and a tab, said linkage tunnel being positioned on the interior side of said support tapes, said pull tab extending from said linkage tunnel to the exterior side of said support tapes.

5,008,987

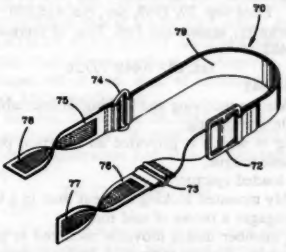
MULTI-PURPOSE FASTENING DEVICE

Thomas W. Armour, II, 645 Isle View Dr., Akron, Ohio 44319

Filed Jan. 12, 1990, Ser. No. 464,300

Int. Cl.[5] A44B *18/00*

U.S. Cl. 24—442 **2 Claims**



1. A multi-purpose fastening device comprising:

a first and second elongated carrier strip, each strip having a first end and a second end and a first and a second surface;

said first end of each carrier strip defines an aperture through its width and each strip further comprising a ring connected to said strip such that an arc of said ring passes through said aperture,

a web of material having two ends, each end being connected to the first end of one of said elongated carrier strips using a connecting means; and

a means for removably engaging said first elongated strip to said second elongated strip comprising at least a first hook and loop type engaging element affixed to at least one surface of said first carrier strip and at least a second hook and loop type engaging element affixed to at least one surface of said second carrier strip and opposing the surface of the first hook and loop type engaging element affixed to said first carrier strip so that said first and second strips lockably engage upon contact.

5,008,988

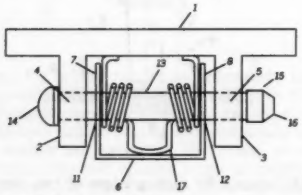
CLIP ASSEMBLY

Virgil F. Kuhl, Lauderhill, and Guenter Noll, Ft. Lauderdale, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 20, 1989, Ser. No. 409,857

Int. Cl.[5] A44B *21/00*

U.S. Cl. 24—510 **6 Claims**



1. A clip assesmbly comprising:

a clip, having at least two resiliently expandable holes therein;

a bracket, having at least two resiliently expandable holes for alignment with said holes in said clip;

a spring for biasing said clip towards said bracket;

a pin positioned through said holes for pivotally securing said bracket to said clip, said pin having a head that is passed through said holes, said head being intergrally connected to said pin and having a diameter that is greater than at least one of said holes for retaining the assembly, said pin having a second head integrally connected to said pin and having a diameter greater than the holes in the clip and bracket.

5,008,989

SAFETY BELT BUCKLE

Peter Wedler, Bütlingen, and Peter Eckmann, Hamburg, both of Fed. Rep. of Germany, assignors to Autoflug GmbH & Co. Fahrzeugtechnik, Rellingen, Fed. Rep. of Germany

Filed Sep. 29, 1989, Ser. No. 415,026

Claims priority, application Fed. Rep. of Germany, Oct. 1, 1988, 3833483

Int. Cl.[5] A44B *11/26*

U.S. Cl. 24—641 **17 Claims**

1. A buckle for receiving and locking an insertable tongue of a safety belt, comprising:

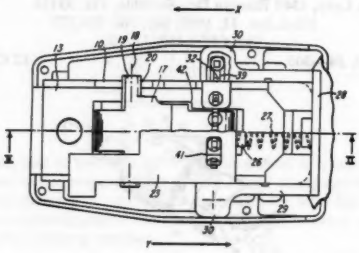
a housing in which is provided an insertion path for said insertable tongue;

a spring-loaded ejector;

a pivotably mounted locking element that, in a locked position, engages a recess of said tongue;

securing member means movably mounted in said housing and serving for securing said locking element in said locked position thereof; and

a slidable actuator that is guided in said housing transverse to a plane of movement of said locking element and serves to release same, with said locking element, to protect it from acceleration shocks, cooperating with counterweight means guided in said housing, whereby said counterweight means cooperates with said securing member means to prevent release of said locking element in response to acceleration forces that act on buckle parts;



said slidable actuator and said counterweight means being disposed in such a way that they are spaced from one another and act upon respective portions of said securing member means for urging the same in opposite directions, with said slidable actuator and said counterweight means each being coupled with said securing member means in an interlocking manner.

5,008,990

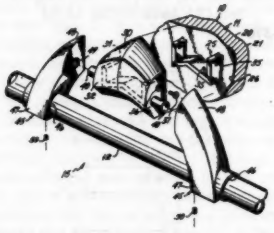
HARDWARE FOR MOUNTING A CASKET HANDLE BAR

William K. Craft, North Bend, Ohio, assignor to Batesville Casket Company, Inc., Batesville, Ind.

Filed Mar. 29, 1990, Ser. No. 501,015

Int. Cl.[5] A61G *17/00*

U.S. Cl. 27—2 **8 Claims**



1. In a casket having a metal shell, a hardware assembly comprising:

a block fixed to said shell,

a fixed handle bar mount mounted over said block, said bar mount having laterally, horizontally-projecting trunnions,

a horizontal bar, a pair of arms slidable on said bar, each said arm having a hole to receive a trunnion,

and means to fix each said arm on said bar after it receives said trunnion.

5,008,991

DEVICE AND PROCESS FOR INTERMINGLING A BUNDLE OF THREADS USING A TURBULENT AIR STREAM

Andreas Lachenmeier, Widnau, Switzerland, assignor to Viscosuisse S.A., Emmenbrucke, Switzerland

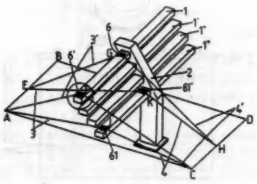
PCT No. PCT/CH88/00170, § 371 Date May 24, 1989, § 102(e) Date May 24, 1989, PCT Pub. No. WO89/02942, PCT Pub. Date Apr. 6, 1989

PCT Filed Sep. 23, 1988, Ser. No. 362,388

Claims priority, application Switzerland, Sep. 30, 1987, 3793/87

Int. Cl.[5] D02J *1/08;* D02G *1/16*

U.S. Cl. 28—271 20 Claims



1. Device for intermingling a wet bundle of threads composed of smooth multifilaments in a turbulent air stream, including a nozzle body with transverse U-shaped thread channels, each thread channel having an inlet part, an outlet part, and a turbulence part therebetween, said turbulence part having a length in the direction of thread movement and a diameter transverse thereto, said length being greater than said diameter, said turbulence part having a centered compressed air inlet, the diameter of the inlet part and the outlet part being smaller than the diameter of the turbulence part.

5,008,992

METHOD OF PRODUCING A BULKED COMPOSITE YARN

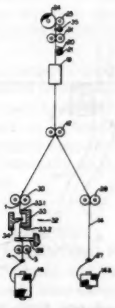
Bernd Gehrmann, Schwelm, and Heinz Treptow, Ennepetal-Milspe, both of Fed. Rep. of Germany, assignors to Barmag AG, Remscheid, Fed. Rep. of Germany

Filed Oct. 12, 1989, Ser. No. 420,571

Claims priority, application Fed. Rep. of Germany, Oct. 15, 1988, 3835138; Dec. 10, 1988, 3841740

Int. Cl.[5] D02G *1/20*

U.S. Cl. 28—271 26 Claims



1. A method for combining a relatively elastic yarn component with a relatively inelastic yarn component composed of yarn filaments, and so as to produce a bulked composite yarn, and comprising the steps of,

advancing each of the yarn components along respective paths of travel, and including withdrawing the elastic yarn component from a supply package, while

spreading the filaments of the advancing inelastic yarn component, and then

guiding the advancing components through a jet of high velocity fluid so that the jet impinges on the two components and entangles the filaments and combines the two yarn components to form a composite yarn, and wherein the speed of the resulting composite yarn immediately following its being guided through said jet of high velocity fluid is substantially greater than the speed at which the elastic yarn component is withdrawn from its supply package.

5,008,993

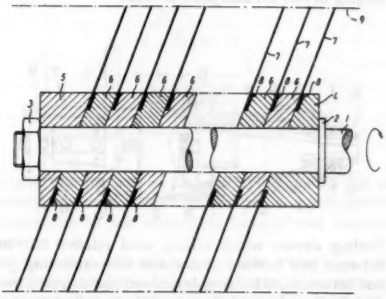
METHOD OF MAKING SURFACE FINISHING ROLLERS AS WELL AS A ROLLER MADE THEREBY

Bent Malherbe, Espergaerde, Denmark, assignor to Sony Corporation, Tokyo, Japan

Filed May 23, 1990, Ser. No. 527,386

Int. Cl.[5] B24B *9/02*

U.S. Cl. 29—125 7 Claims



1. A method of making surface finishing or polishing rollers comprising disk-shaped surface finishing elements mounted successively on a spindle rotating in operation, each of said surface finishing elements being formed of a slitted, preferably rectangular sheet which has a portion of material continuous in one direction with lamellae protruding perpendicularly therefrom, characterized in that the slitted sheet is shape-fixed with binder by arranging the portion of material continuous in one direction over an oval mandrel where the periphery of the protruding lamellae therein forms an ellipse, and that a plurality of surface finishing elements, each comprising an oval disk with lamellae, are mounted inclined on the shaft of the spindle so that the contour of the successively mounted surface finishing elements is cylindrical in the axial direction of the spindle.

5,008,994

APPARATUS AND METHOD FOR FITTING A PROTECTIVE BOOT PARTICULARLY FOR ARTICULATED JOINT ASSEMBLIES

Helmut Rettig; Karl Weiss, both of St. Augustin, and Erich Buss, Cologne, all of Fed. Rep. of Germany, assignors to Uni-Cardan Aktiengesellschaft

Division of Ser. No. 7,784, Jan. 28, 1987, Pat. No. 4,815,187. This application Nov. 18, 1988, Ser. No. 273,665

Claims priority, application Fed. Rep. of Germany, Jan. 31, 1986, 3602867

Int. Cl.[5] B23P *19/04*

U.S. Cl. 29—235 7 Claims

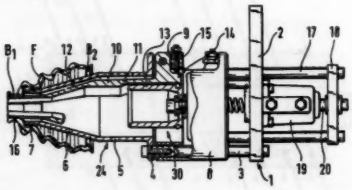
1. A device for fitting a protective boot to a shaft member particularly in a universal joint, said boot having a first collar for fitting to said shaft member, and a second collar, said device comprising in combination:

an expanding device for expanding said first collar of said

boot, said expanded device having a receiving region capable of being placed in a first untensioned position and in a second tensioned position, said receiving region, when in said first position, having a circular cross section with a diameter smaller than an inner diameter of said first collar and, when in said second tensioned position, having a circular cross section with a diameter which is larger than an outer diameter of said shaft member, said expanding device being provided with a plurality of levers having receiving regions formed by segments of a cylindrical member, said levers incorporating the receiving region forming a cylinder, a transition area in total forming a cone and a base area which is cylindrical and encloses an expanding member;

a stripping device axially movable relative to said expanding device and having an inner diameter corresponding to an outer diameter of said expanding device in said second tensioned position, said stripping device being movable to a first position at which it leaves said receiving region of said expanding device radially freely accessible and to a second position at which it surrounds at least partially circumferentially said receiving region along the entire length of the receiving region;

a holding device for said shaft member;



a feeding device which effects axial relative movement between said holding device and said expanding device and between said holding device and said stripping device, said feeding device being movable to a first position at which it provides an axial distance between said shaft member and said receiving region to permit mounting of said boot on said receiving region, and to a second position at which it holds said expanding device together with said first collar slipped onto said receiving region in an axial association relative to said shaft member; and

a slide frame connected to an axially movable part of said feeding device, said slide frame receiving said expanding device and said stripping device, said slide frame being provided with a base plate, several stay bolts as well as an annular disc on which the expanding device is firmly supported, wherein a bearing housing for the levers of the expanding device is guided by guiding rods in said base plate, an adjusted cylinder for the stripping device being arranged between a head plate of said guiding rods and said base plate, and said bearing housing for the levers of the expanding device receiving said expanding member for expanding said receiving region of the expanding device.

5,008,995

BRAKE SHOE RIVET PRESS

Bruce R. Johnson, Muskegon, Mich., assignor to Muskegon Automation Equipment, Inc., Muskegon Heights, Mich.

Filed Jul. 2, 1990, Ser. No. 547,829
Int. Cl.[5] B23P *19/04*
U.S. Cl. 29—252 **10 Claims**

1. A brake shoe rivet press for removing in a single operation rivets arranged in rows to hold a liner to the base of a brake shoe to thereby permit removal and later replacement of the liner thereon, comprising:

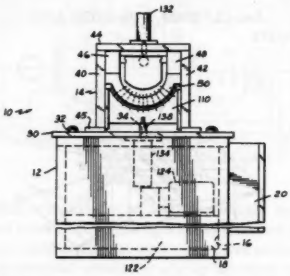
a frame;

a punch holder fixedly carried by said frame and having a plurality of movable punches arranged in rows;

upper and lower rams movably carried by said frame on opposite sides of said punch holder;

said lower ram having a support surface for positioning and supporting the brake shoe and further including a plurality of openings arranged in rows for receiving the spent rivets;

said upper ram having an operating surface, which, when the upper ram is actuated, engages the punches so as to



urge them against the rivets to remove them from the brake shoe in a single operation;

said upper ram includes one or more holes in said operation surface to receive and thereby permit the corresponding punch or punches not to be engaged when said upper ram is activated; and

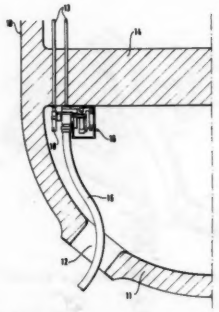
said upper ram includes a hydraulic cylinder for adjusting the horizontal position of said upper ram with respect to the punch holder to selectively align said holes with said punches.

5,008,996

MACHINE FOR REMOTELY LINING THE INSIDE OF A HEAT EXCHANGER TUBE END WITH A SLEEVE

Christian Bonnand, Bachy; Dominique Mascart, Toufflers, and Philippe Druelle, Gournay-sur-Marne, all of France, assignors to Stein Industrie, Velizy-Villacoublay and Electricte de France, Paris, both of, France

Filed Apr. 25, 1989, Ser. No. 342,826
Claims priority, application France, Apr. 25, 1988, 88 05448
Int. Cl.[5] B23P *15/26*
U.S. Cl. 29—727 **15 Claims**



1. A machine for remotely lining the inside of a heat exchanger tube end with a sleeve within a heat exchanger, said heat exchanger comprising a tube plate supporting a plurality of tubes, each tube having a tube end, each said tube end being mounted in said tube plate of said heat exchanger with a water box being disposed beneath the tube plate, the water box being

accessible from the outside via a manhole, the machine operating by a method including inserting a sleeve into each tube end, diametrically expanding the sleeve in a zone inside the tube plate and in a zone beyond the tube plate, then expanding the sleeve by rolling and then welding the sleeve in each of the expansion zones, said machine comprising a push-pull device outside the water box, with a flexible tube connecting the push-pull device to a motorized unit driving sleeve-fixing tools, a tool loader at a head of a cable driven by the push-pull device, and means for bringing an end of the flexible tube level with the tube end of each of said tubes in succession, and wherein the motorized unit for driving the tools comprises two superposed fluted hubs one hub being driven by a low speed electric motor and the other hub being driven by a pneumatic motor having a high speed of rotation.

5,008,997

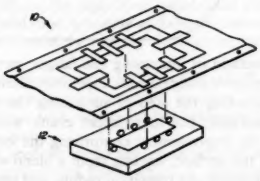
GOLD/TIN EUTECTIC BONDING FOR TAPE AUTOMATED BONDING PROCESS

William S. Phy, Los Altos Hills, Calif., assignor to National Semiconductor, Santa Clara, Calif.

Continuation of Ser. No. 245,864, Sep. 16, 1988, abandoned. This application Nov. 28, 1989, Ser. No. 443,011

Int. Cl.[5] B23K *31/02;* **H01L** *23/48, 29/54*

U.S. Cl. 29—827 **14 Claims**



1. A tape automated bonding method of bonding copper beam leads of lead frame tape to gold die bumps formed on contract pads of a semiconductor device, wherein the tape includes a plurality of interconnected beam leads defined by at least one opening in the tape such that each beam lead has an inner end and an outer end, the method comprising:

depositing a gold layer on the copper beam leads;

masking a region of each beam lead from further deposition of material such that a predetermined portion of each beam lead is exposed for further deposition of material;

depositing by sputtering or vapor deposition a predetermined amount of tin layer on the gold layer on the exposed portion of each beam lead;

establishing contact between the tin layer on each beam lead and a gold die bump to which each beam lead is to be bonded after the tin layer has been deposited on said beam lead; and

applying to the contact between each lead and die bump a predetermined amount of pressure and heat, thereby forming a bond between each beam lead and the die bump to which the beam lead is to be bonded such that the bond formed includes a primary eutectic of the combination of tin and gold with substantially no pure tin in contact with the copper beam lead.

5,008,998

METHOD OF MOUNTING FLAT COIL

Shigetaka Higuchi; Isao Noguchi, and Tohru Odashima, all of Tochigi, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Nov. 22, 1989, Ser. No. 440,251

Claims priority, application Japan, Dec. 5, 1988, 63-307535

Int. Cl.[5] C23C *26/00*

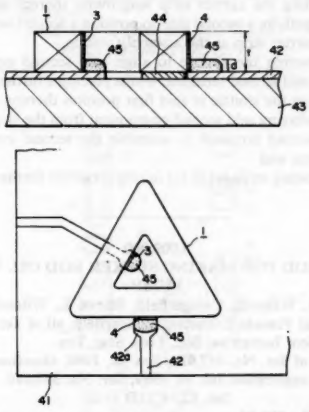
U.S. Cl. 29—840 **5 Claims**

1. A method of mounting a flat coil, comprising the steps of:

forming, at a first end portion and a last end portion of a flat coil which is formed by winding an insulator layer and a metal foil sheet in layers, a pair of terminal portions each composed of a layer of solder and extending over the full extent of an axial length of said flat coil;

preparing a circuit board which has formed thereon a conductor pattern which has connecting faces for connection to said terminal portions of said flat coil;

coating solder material on said connecting faces of said conductor pattern;



disposing said flat coil on said circuit board such that said terminal portions thereof are opposed in a perpendicular relationship to said connecting faces of said conductor pattern; and

heat processing said solder material to cause said solder material to adhere to faces of said terminal portions over the entire extent of the axial length of said flat coil to interconnect said connecting faces of said conductor pattern and said terminal portions of said flat coil.

5,008,999

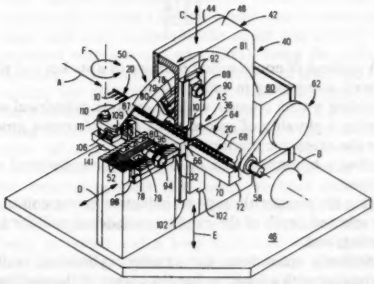
METHOD OF ASSEMBLING COMPONENTS TO ELECTRICAL TERMINALS

Robert S. Correll, Jr., Harrisburg, and David D. Wiltraut, Hershey, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Mar. 29, 1990, Ser. No. 502,082

Int. Cl.[5] H01R *43/04*

U.S. Cl. 29—882 **9 Claims**



1. A method of assembling components to electrical terminals connected together in side by side spaced relationship by means of a carrier strip, the method comprising the steps of:

(a) feeding the carrier strip lengthwise thereof through a

component assembly station along a feed path to position a first terminal of the carrier strip at the assembly station;

(b) advancing a shuttle having a first component located at a first position thereon, to align that component with said first terminal at the assembly station, whilst placing a second component on the shuttle at a second position spaced from said first position;

(c) transferring said first component from the shuttle onto said first terminal to assemble said first component thereto;

(d) feeding the carrier strip lengthwise thereof along said feed path by a second step to position a second terminal of the carrier strip at the assembly station.

(e) retracting the shuttle to align said second component with said second terminal, whilst placing a further component on the shuttle at said first position thereon;

(f) transferring said second component from the shuttle onto the second terminal to assemble the second component thereto; and

(g) repeating steps (a) to (c) in respect of the further component.

5,009,000

METHOD FOR MAKING SUCKER ROD OIL WELL PUMP

Thomas S. Wilmeth, Daingerfield; Steven L. Wilmeth, Longview, and Francis E. Foster, Daingerfield, all of Tex., assignors to Scot Industries, Inc., Lone Star, Tex.

Division of Ser. No. 167,911, Sep. 28, 1988, abandoned. This application Jul. 19, 1989, Ser. No. 383,019

Int. Cl.[5] C21D *1/10*

U.S. Cl. 29—888.02 **7 Claims**

1. A method of constructing portions of a sucker rod pump for a well, comprising in combination:

providing a steel plunger with an exterior cylindrical wall;

forming a plurality of spaced apart circumferential grooves in the exterior cylindrical wall; then

forming a boronized case on the exterior cylindrical wall; then

passing the plunger through an induction heater coil to heat a selected depth of the exterior cylindrical wall for hardening; and

immediately quenching the exterior cylindrical wall by spraying with a liquid to harden a layer of the steel below the boronized case for supporting the boronized case;

providing a barrel with a cylindrical bore; and

forming a chromium case on the bore to a selected depth for receiving the plunger in sliding contact.

5,009,001

METHOD OF INCREASING THE FATIGUE STRENGTH OF CRANKSHAFTS

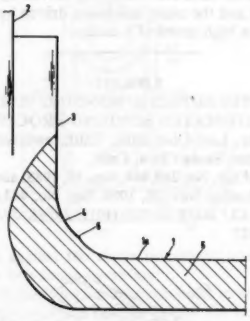
Gerhard Deschler, Nuremberg, Fed. Rep. of Germany, assignor to MAN Nutzfahrzeuge Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed May 18, 1990, Ser. No. 525,474

Claims priority, application Fed. Rep. of Germany, May 19, 1989, 3916421

Int. Cl.[5] F16C *3/10*

U.S. Cl. 29—888.08 **3 Claims**



1. In a method of increasing the fatigue strength of crankshafts for reciprocating engines, especially internal combustion engines, including the step of subjecting the transition radii from a crankshaft pin to adjacent crank webs to a special treatment, the improvement comprising the steps of:

finishing the surface, starting from a blend edge, between a bearing point and transition radius, and proceeding to the end of a butting collar, to a peak-to-valley height of greater than 6.3 μm; and

effecting hardening in the region of said transition radii to a hardening zone depth of 2 to 3 mm.

5,009,002

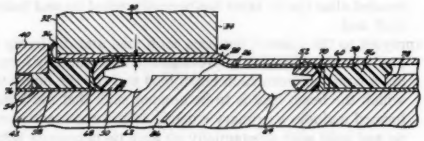
METHOD FOR RADIALLY EXPANDING AND ANCHORING SLEEVES WITHIN TUBES

John W. Kelly, La Canada, Calif., assignor to Haskel, Inc., Burbank, Calif.

Filed Jan. 11, 1990, Ser. No. 463,367

Int. Cl.[5] B23D *15/26*

U.S. Cl. 29—890.031 **18 Claims**



12. A method for radially expanding and anchoring a sleeve within a tube, which is contained within a bore in a surrounding structure having a primary side and a secondary side but extends axially beyond the secondary side of said structure, so as to repair a defective area of said tube and form a tight and substantially leakproof joint between said tube and sleeve, said method comprising the steps of:

inserting said sleeve within said tube from the primary side of said structure so that said sleeve extends axially beyond the secondary side of said structure;

inserting a hydraulic expanding mandrel having an elongated body with two axially separated seals within said sleeve so that said mandrel and said sleeve together define

a substantially annular hydraulic pressure zone situated between said sleeve, said body and said seals with a certain portion of said pressure zone being situated beyond said secondary side, said mandrel having a passage for conveying pressurized fluid to said pressure zone;

causing a first pressurized fluid from a fluid source to be supplied to a hydraulic swaging control system, said fluid source further containing a second fluid, said control system including,

a first pump which is linked to said fluid source and to said passage and which pressurizes said second fluid upon being driven by said first fluid,

a second pump which is linked to said fluid source and to said passage and which pressurizes said second fluid upon being driven by said first fluid, and

fluid control means, linked to said fluid source and driven by said first fluid, for selectively activating said second pump and controlling the total volume of said second fluid pressurized by said second pump through application of fluid stroke signals to said second pump, said fluid control means further being responsive to the pressure at which said second fluid is pressurized by said first pump,

activating said first pump;

introducing a first supply of pressurized fluid, which is produced by said first pump, into said pressure zone through said passage until said first supply reaches a predetermined pressure which is above the radial yield point of said sleeve but below the aggregate radial yield point of said sleeve and said tube, whereby said sleeve pre-expands into said tube substantially radially throughout said pressure zone;

activating said second pump by means of said fluid control means when said predetermined pressure of said first supply is above said yield point but below said aggregate yield point; and

introducing a predetermined aggregate volume of a second supply of pressurized fluid, which is produced by said pump, into said pressure zone through said passage at a predetermined maximum pressure which is above said aggregate yield point, whereby said sleeve further expands substantially radially throughout the area of said pressure zone that is situated axially beyond said secondary side and said tube expands substantially radially along with said sleeve.

5,009,003

RAZOR

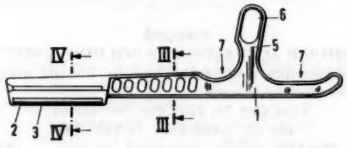
Kenneth Grange, London, England, assignor to Wilkinson Sword Gesellschaft mit beschränkter Haftung, Solingen, Fed. Rep. of Germany

Filed Aug. 31, 1989, Ser. No. 400,660

Claims priority, application Fed. Rep. of Germany, Sep. 3, 1988, 8811140

Int. Cl.[5] B26B *19/00, 21/10*

U.S. Cl. 30—30 **7 Claims**



1. In a razor comprising an elongated handle which has a front end and a rear end, at said front end of which is disposed a razor blade having a cutting edge, and also comprising, on that side of said handle opposite said cutting edge of said razor blade, in the vicinity of but spaced from said rear end of said handle, a projecting handle extension, the improvement wherein:

said handle extension is embodied as a short stub extension that is fixedly disposed on said handle, with said stub extension being integral with said handle and being provided with an opening, whereby depression means that extend in the longitudinal direction of said elongated handle are disposed on at least one side of said stub extension; and

said handle has a double T profile.

5,009,004

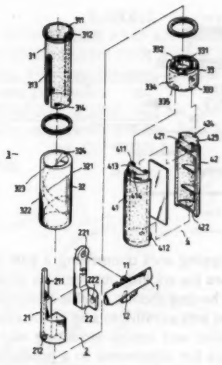
FOLDABLE RAZOR ASSEMBLY

Lung-Wu Yen, No. 28, Ming Cheng Street, San Ming Area, Kao Hsiung City, Taiwan

Filed Aug. 2, 1990, Ser. No. 562,557

Int. Cl.[5] B26B *21/00, 21/14*

U.S. Cl. 30—47 **3 Claims**



1. A foldable razor assembly essentially comprising a blade support (1) substantially T-shaped having a horizontal plate for installing a blade, the rear surface thereof being provided with a protruding element (11) and a guide slot (12) for engagement;

a shaft means (2) consisting of a first mounting element (21) and a second mounting element (22) which are mounted to each other, a pimple (212) being provided at the top end of the first mounting element (21) for engagement with the guide slot (12) of said blade support (1), an aperture (221) being provided at the top end of the second mounting element (22) for the engagement with the protruded element (11) of the blade support (1), the bottom end of the shaft means (2) being circular and used for the engagement with a handle means (3), a pair of pimples (212) (222) being provided oppositely along the lower end of said shaft means (3);

said handle means (3) consisting of an inner cylinder (31), an outer cylinder (32) and a cylinder recess (33), said inner cylinder (31) having a hollow center which can be used to adapt said shaft means (2), the upper end thereof being provided with a round edge (311), along the surface of said inner cylinder (31), a low vertical slot (313) and a high vertical slot (312) in opposite position being provided, at the bottom end of said inner cylinder (31), a plurality of fixing holes (314) being provided for engagement, the outer cylinder (32) having a hollow center which is be used to adapt said inner cylinder (31), the interior wall of the external cylinder (32) being provided with a high spiral slot (321) and a low spiral slot (322), at the top end of said high spiral slot (321), a short horizontal slot (323) being provided and a long horizontal slot (324) being provided at the top end of said low spiral slot (322), the difference in distance between the two horizontal slots (324) (323) being equal to the tangent of the difference in distance between the height of the two spiral slots (321) (322),

the cylinder recess (33) being mounted at the bottom of said

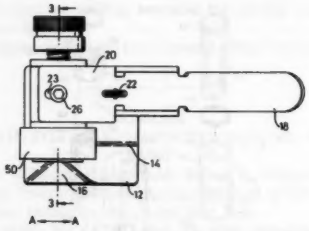
handle means (3) with arch shaped structure (331) mounted along the top section of said cylinder recess (33), a depression being formed by the arch shape structure (331) and the interior wall of said cylinder recess (33) for the insertion of said inner cylinder (31), the external wall of the arch-shaped structure being provided with a plurality of fixing protrusions (332) for engagement.

5,009,005

CABLE STRIPPER

Zdzislaw Bieganski, "Brushwood" , Kinsbourne Green, Harpenden Hertfordshire, United Kingdom

Filed Dec. 14, 1989, Ser. No. 451,114
Int. Cl.[5] B26B *27/00;* B21F *13/00;* B23D *21/06;* H02G *1/12*
U.S. Cl. 30—90.6 8 Claims



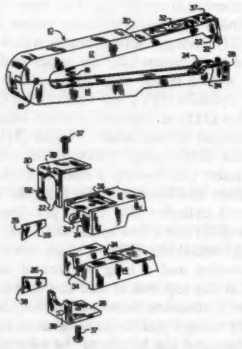
1. A cable stripping tool comprising a pair of jaws; means coupling said jaws for rocking movements about a pivot axis, one of said jaws having therein a cable-receiving groove having a longitudinal axis parallel to said pivot axis; a cutter having a cutting point; and means mounting said cutter on the other of said jaws for adjustment to a position in which said cutting point lies in a single plane coincident with said longitudinal axis and parallel to said pivot axis in any selected pivotally adjusted position of said jaws.

5,009,006

CABLE STRIPPING TOOL

Alan G. Sawyer, 6346 Beulah Church Rd., Liberty, N.C. 27298; Dale L. Hughes, 1505 McCuiston Dr., Burlington, N.C. 27215, and Edwyn H. Petree, Burlington, N.C., assignors to Alan G. Sawyer, Liberty and Dale L. Hughes, Burlington, both of, N.C.

Filed Aug. 28, 1989, Ser. No. 399,744
Int. Cl.[5] H02G *1/12*
U.S. Cl. 30—90.6 17 Claims



1. A hand tool for stripping insulation or sheathing from a cable having at least one conductor, comprising:

(a) a pair of jaws adapted to move from an open position to a closed position;

(b) a pair of oppositely mounted cutting blades, said blades being mounted to said jaws along the longitudinal axis of the cable and adjacent to the cable, said blades being adapted to make longitudinal cuts in the insulation or sheathing of the cable when said pair of jaws are in said closed position;

(c) a pair of opposed, substantially rigidly mounted cutting blades, said blades being mounted at a predetermined distance with respect to one another; and

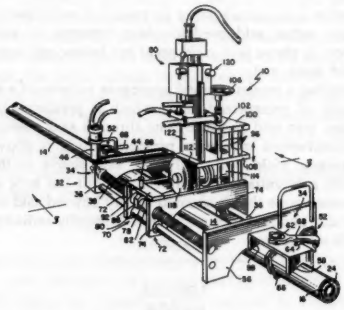
(d) means for moving said pair of opposed, substantially rigidly mounted cutting blades from an open position to a position where said blades are moved in a tangential path, contacting opposite sides of the cable, continuing through at least a portion thereof of the insulation or sheathing, and passing clear of the cable, thereby scoring the insulation or sheathing on opposite sides; whereby the insulation or sheathing can be removed from the cable.

5,009,007

WINDOW CUTTER FOR GAS SERVICE TIE OVERS

Luther W. Martin, 1221 Julie Dr., Champaign, Ill. 61821, and Richard L. Smith, R.R. 2 - Box 82A, Edwardsville, Ill. 62025

Filed Oct. 23, 1989, Ser. No. 425,101
Int. Cl.[5] B22B *5/00*
U.S. Cl. 30—92 10 Claims



1. A pipe slitter comprising a base for fixing the slitter to a pipe to be slit thereby, the base comprising a pair of end plates for mounting transversely of the pipe and a pair of connecting rods for coupling the end plates to each other, the connecting rods extending longitudinally of the pipe, a carriage for supporting a slitter blade, means for movably supporting the carriage on the base for movement longitudinally of the pipe, and means for movably supporting the slitter blade on the carriage for movement transversely of the pipe.

5,009,008

THUMB ACTUATOR FOR FOLDING KNIFE

Max Yablonovitch, Dollard-des-Ormeaux, Canada, assignor to Y.B. Technology, Canada

Filed Oct. 16, 1989, Ser. No. 421,647
Int. Cl.[5] B26B *3/06, 13/00, 1/00*
U.S. Cl. 30—158 11 Claims

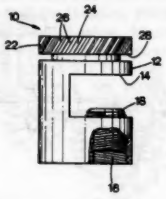
1. An attachment for a folding knife of the type comprising a blade pivotally mounted to a handle for movement between opened and closed positions, said attachment comprising:

a body;

a recess in said body for receiving therein an edge of said blade;

a screw threadedly engaged in said body capable of protruding in said recess for engaging said blade to lock said body to said blade; and

a curved finger engaging surface on said body allowing said blade to pivot from said closed position to said open position with one hand by exerting finger pressure on said finger engaging surface while holding said handle.

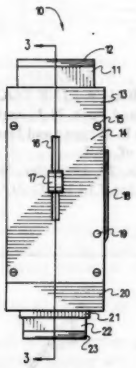


5,009,009

SCRAPING TOOL

Robert A. Stinson, Box 107 Greenbriar Acres, Wise, Va. 24293

Filed Jul. 19, 1989, Ser. No. 381,802
Int. Cl.[5] B26B *3/00*
U.S. Cl. 30—172 15 Claims



11. A scraping tool, comprising:

an elongated housing having first and second opposite ends;

a first scraping blade mounted for selective extension and retraction through said first housing end;

a second scraping blade mounted for selective extension and retraction through said second housing end;

locking means for securing said first and second blades in a selected adjusted position; and

a paint can opening bar mounted for pivotal movement between open and closed positions in an elongated recess formed in a side wall portion of said housing.

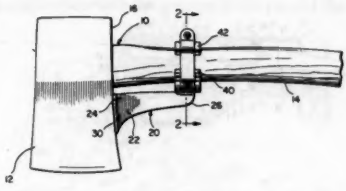
5,009,010

AXE HEAD MOUNTED HANDLE PROTECTOR

Gary L. Burlison, 31909 S.E. Green River Gorge Rd., Black Diamond, Wash. 98010-7529

Filed May 18, 1990, Ser. No. 524,987
Int. Cl.[5] B26B *23/00;* B25G *3/20*
U.S. Cl. 30—308.1 11 Claims

1. A wood splitting implement for splitting log sections into firewood, said implement including an elongated horizontal handle having front and rear ends, a downwardly facing splitting head mounted on said front end, said head including a rear side projecting above and below said handle, a rigid arm rigidly supported from said rear side of said head, at an elevation spaced below said handle, against upward displacement relative to said head and projecting rearwardly from said rear side beneath said handle in closely spaced relation relative thereto, and resilient spacing and bracing body means spaced rearward of said rear side and interposed between the rear end of said arm and the opposing underside portion of said handle.

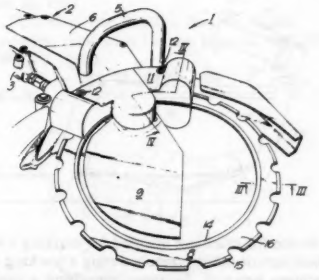


5,009,011

ANNULAR SAW BLADE AND ANNULAR SAW WITH DRIVING MEANS FOR A SAW BLADE

Mats Johansson, Forshaga, Sweden, assignor to Diaglobe Aktiebolag, Forshaga, Sweden

Filed Jun. 4, 1990, Ser. No. 531,401
Claims priority, application Sweden, Jun. 2, 1989, 8902009
Int. Cl.[5] B27B *5/14*
U.S. Cl. 30—389 7 Claims



1. Annular saw blade comprising an outer periphery provided with cutting or tearing members (15), an inner periphery, and an annular web portion (16) between said inner and outer peripheries, characterized in that the saw blade (8) is provided with at least one annular drive surface of a flexible, polymeric, solid material (14), and that a rotatable drive member (30) can be pressed against said annular drive surface to effect rotation of the saw blade about its center of rotation.

5,009,012

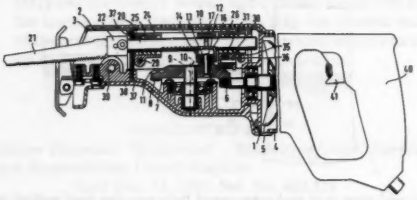
SABER SAW

David M. Martinez, New Bern, N.C., and Gordon C. Campbell, Exton, Pa., assignors to Robert Bosch Power Tool Corporation, New Bern, N.C.

Continuation of Ser. No. 238,037, Aug. 29, 1988, Pat. No. 4,884,344. This application Sep. 1, 1989, Ser. No. 402,333
The portion of the term of this patent subsequent to Dec. 5, 2006, has been disclaimed.
Int. Cl.[5] B23D *49/04*
U.S. Cl. 30—394 6 Claims

1. A saber saw, comprising an elongated displacing rod which supports a saw blade and is reciprocable in a displacement direction extending along its elongation and also swingable in a swinging direction which is transverse to said displacement direction; and means for moving said displacement rod in said swinging direction and including a driveable control element having a cam surface and a sensing element which is connected with said displacement rod and is controlled by said control element, said control element being rotatable

about an axis of rotation, said cam surface of said control element being formed as a symmetrical conical surface which



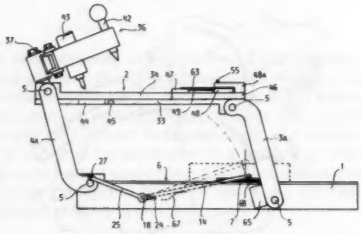
is eccentrical relative to said axis of rotation of said control element.

5,009,013

DEVICE IN MACHINES FOR THE MARKING OF WORKPIECES

Henry W. Wiklund, Backvagen 1,S-820 10, Arbra, Sweden

Filed Nov. 17, 1989, Ser. No. 438,676
Claims priority, application Sweden, Nov. 30, 1988, 8804333
Int. Cl.[5] B43L *13/10*
U.S. Cl. 33—25.1 **15 Claims**



1. A device for machines adapted for marking a workpiece with characters or other symbols during a marking operation, said machines being of the type comprising a marking tool which applies the symbols to the workpiece and means for the selection of symbols and control of the movements of the tool in order to obtain a predetermined shape and size of the symbols, said device characterized by a lower frame part (**1**) for receiving said workpiece (**7**), an upper frame part (**2**) arranged on said lower frame part and means (**3***a*, **3***b*, **4***a*, **4***b*) for connecting said frame parts for raising and lowering said upper frame part relative to said lower frame part (**1**), said upper frame part supporting the marking tool (**43**) and the symbol selection and control devices (**36–42**, **47–52**, **69–74**) and being arranged, during the marking operation, to rest on the workpiece (**7**) and clamp said workpiece (**7**) against the lower frame part (**1**), said upper frame part (**2**) having an opening (**44**) through which the marking tool works on the workpiece (**7**).

5,009,014

RAILROAD RAIL PROFILE MEASURING SYSTEM

David J. Leach, Ludington, Mich., assignor to Pandrol Jackson, Inc., Ludington, Mich.

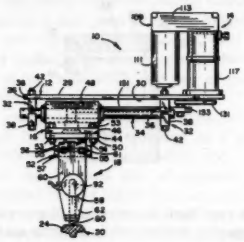
Filed Feb. 7, 1989, Ser. No. 307,847
Int. Cl.[5] B61K *9/00*; **G01B** *5/20*
U.S. Cl. 33—287 **24 Claims**

1. A rail profile measuring apparatus for measuring the profile of a rail head, said apparatus comprising:

carriage means for supporting said apparatus for longitudinal movement along the rail head;

sensing means supported by said carriage means for sensing the position of a point on the rail head; and

moving means for laterally translating said sensing means across the rail head while said carriage means moves said sensing means longitudinally along the rail head, whereby said sensing means moves both longitudinally and laterally



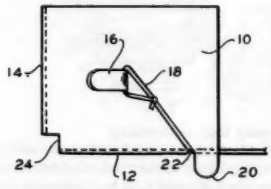
with respect to the rail head to acquire information at a plurality of spaced locations along longitudinal lines on the rail head.

5,009,015

BRICK LINE TOOL

Robert F. Redl, Midland Park, N.J., assignor to Louis J. Volpe, Jr., Wayne; Steven E. Wagner and Daniel L. Kurpick, both of Prospect Park, all of, N.J.

Filed Jun. 20, 1989, Ser. No. 369,080
Int. Cl.[5] E04G *21/18*
U.S. Cl. 33—409 **6 Claims**



1. A tool for aligning bricks comprising:

a first flat top plate having a front wall and a side wall extending downwardly at right angles from said plate for engaging the top face, the front face and one side face of a brick;

a finger extending forwardly from a front edge at the inner corner of said top plate adjacent the inner end of said front wall and including a notch in said top plate front edge between said finger and adjacent end of said front wall for holding a guideline;

a raised tab cut from a portion of said top plate and extending outwardly along said plate, said tab providing a narrow space above said top plate to receive and hold one end of said guideline therein; and

the outer end of said front wall being spaced from said side wall and the front end of said side wall being spaced from said front wall including a cutout section in the outer corner of said top plate and in said front and side walls for receiving and exposing the outer corner of said brick, said tool being positionable over the outer corner of said brick so that said corner of said brick extends into said cutout section.

5,009,016

METHOD FOR ON-MACHINE COATING-DRYING OF A PAPER WEB OR THE LIKE

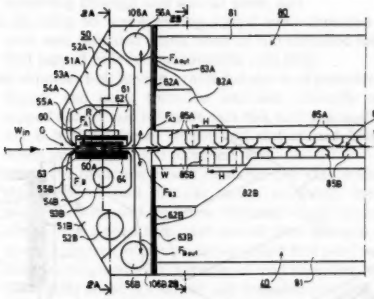
Matti LePisto, Turku; Reijo Ilmanen, Piikkio; Markku Karlsson, Parainen, and Sauli Laakso, Masku, all of Finland, assignors to Valmet Oy, Helsinki, Finland

PCT No. PCT/FI87/00159, § 371 Date Jul. 14, 1989, § 102(e) Date Jul. 14, 1989, PCT Pub. No. WO89/04890, PCT Pub. Date Jun. 1, 1989

PCT Filed Nov. 26, 1987, Ser. No. 381,674

Int. Cl.[5] F26B *3/32*

U.S. Cl. 34—41 8 Claims



1. A method of contact-free drying a paper or board web (W) wherein both infrared radiation (R) and drying air jets are used for drying, said drying air jets carrying said web (W) free of contact as said web moves through said dryer, and wherein after said infrared drying step said web is substantially immediately moved into an airborne web-dryer wherein said web is supported by and dried with air jets, the method comprising:

passing said moving web into an infrared drying gap of an infrared dryer (50);

directing a short duration drying energy pulse at said web, the power of said energy pulse being substantially higher than the average drying power of the dryer per unit of area;

introducing an unheated air flow (F_{Ain}, F_{Bin}) into said infrared dryer (50);

heating said air in said infrared dryer; and

substantially immediately passing said heated air from said infrared dryer to said airborne web dryer (80, 90) for use as replacement air and/or drying air therein.

5,009,017

RETAINING PIN HAVING A POSITIVE KEEPER MEANS

Mark S. Diekevers, and Jerry D. Fidler, both of East Peoria, Ill., assignors to Caterpillar Inc., Peoria, Ill.

Division of Ser. No. 105,469, Sep. 30, 1987, Pat. No. 4,823,486, which is a continuation of Ser. No. 4,515, Jan. 20, 1987, abandoned. This application Dec. 8, 1988, Ser. No. 281,361

The portion of the term of this patent subsequent to Apr. 25, 2006, has been disclaimed.

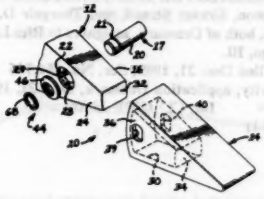
Int. Cl.[5] E02F *9/28*

U.S. Cl. 37—142 A 14 Claims

1. A retaining pin and a keeper means for use in an earthworking device, comprising:

the retaining pin having an outer peripheral surface with an annular groove defined in the outer peripheral surface; and

the keeper means including a metallic washer and a resilient retaining ring, the metallic washer having a frusto-conical side surface and an and an inside surface defining a bore with an annular groove opening in the bore, the pin being slidably disposed within the bore, and the resilient retaining ring having a cross-section with a predetermined radial thickness and when assembled is disposed in locking engagement within the groove on the pin and the groove in the washer, the depth and configuration of the grooves being sufficient to prevent camming of the resilient ring out of the grooves, the retaining ring, in use, is operative in conjunction with the grooves in the pin and the washer



to prohibit disassembly of the pin from the washer without an external force being applied to the pin sufficient to shear the retaining ring or to fracture the washer, and the frusto-conical side surface of the washer is effective to concentrate the force close to the interface of the grooves.

5,009,018

CONTAINER WITH MULTIPLE FUNCTIONS

Alain F. Sebag, 1, rue d'Alesia, F-93000 Bobigny, France

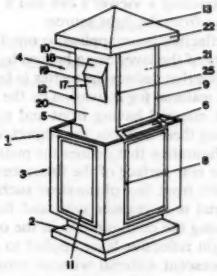
PCT No. PCT/FR86/00429, § 371 Date Sep. 18, 1987, § 102(e) Date Sep. 18, 1987, PCT Pub. No. WO87/03564, PCT Pub. Date Jun. 18, 1987

PCT Filed Dec. 9, 1986, Ser. No. 95,156

Claims priority, application France, Dec. 13, 1985, 85 18477; Dec. 20, 1985, 85 18908

Int. Cl.[5] G09F *3/00*

U.S. Cl. 40—306 7 Claims



1. A container with multiple functions, comprising

dual bodies seated one atop the other with a main prism type body resting on a bearing base, said main prism type body having at least four lateral walls and a top surface, at least one receptacle situated within the main body, said top surface having at least one opening for introducing objects into said at least one receptacle, said receptacle being accessible through an access door provided in one of said lateral walls, an upper body of smaller dimension being located centrally on said main body, said upper body defined by at least two side faces extending substantially upwardly from said top surface and separated by a space, so that the opening of the top surface is situated within said space and between said two side faces of the upper body, a roof with at least two inclined surfaces extending between and being supported by said side faces of the upper body, a container being positioned within said upper body spaced between said roof and said top surface of the main body, at least one flower stand is situated at a place of junction between said main and upper bodies and extending from said top surface in the direction of said bearing base, peripheral walls of said flower stand being defined by at least three said lateral walls of the main

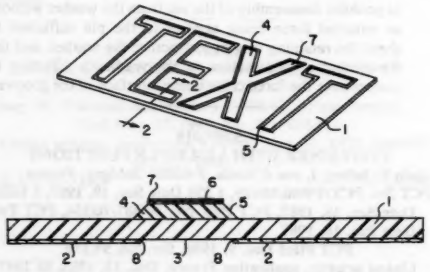
body, whereby objects can be placed in the container through said space separating said side faces.

5,009,019

SIGN PLATE FOR ILLUMINATED SIGN

Gudni Erlendsson, Graves Strand, and Thorgeir D. Hjaltason, Copenhagen, both of Denmark, assignors to Rite Lite Partnership, Chicago, Ill.

Filed Dec. 21, 1989, Ser. No. 454,746
Claims priority, application Denmark, Dec. 21, 1988, 7136
Int. Cl.[5] G09F *13/00*
U.S. Cl. 40—541 7 Claims



1. A sign plate for an illuminated sign having a light source and visual communication matter illuminated thereby, the sign plate comprising:

a sheet of ultraviolet-transmitting material having a front face for attracting a viewer's eye and a rear face for receiving rays from the light source;

an opaque reflective layer applied to one face of the sheet, the integrity of the layer being broken by zones forming a configuration that defines the matter to be communicated,

a fluorescent material for activation by the light source, the fluorescent material having front and rear surfaces with edges joining these surfaces, the edges forming the outline of the configuration that defines the matter to be communicated, the rear surface of the fluorescent material being affixed to the front face of the sheet such that the fluorescent material is in register with and fully covering the zones forming the configuration in the opaque layer; and

an opaque light reflective layer applied to the front surface of the fluorescent material without completely covering the zones, the light reflective layer (1) creating a core area in the midst of the outline, which, when subjected to the light source is unilluminated from the viewer's perspective by the light source and (2) causing an aura around the configuration when subjected to the light source resulting in an enhancement of the illuminated outline from the viewer's perspective.

5,009,020

LIGHT-PASSING DECORATIVE OBJECT

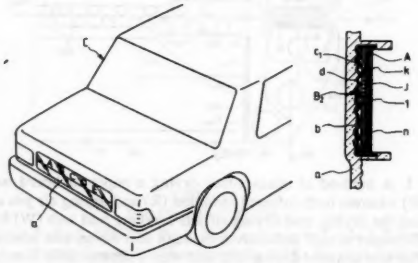
Toshiharu Watanabe, Minokamo, Japan, assignor to Sakae Riken Kogyo Co., Ltd., Japan

Filed Nov. 21, 1988, Ser. No. 273,607
Claims priority, application Japan, Nov. 25, 1987, 62-179158[U]
Int. Cl.[5] G09F *13/00*
U.S. Cl. 40—547 8 Claims

1. A light-passing decorative object comprising:

a light-passing decorative member made of a light-passing synthetic resin, said decorative member including a notch-cut back side;

a film piece having indicia which is viewable through the film piece, the film piece being bonded to the notch-cut back side of the decorative member; and a face brightening device which illuminates the film piece, the brightening device including (a) a plurality of optical fibers having a bundled end, (b) a coupler for coupling the bundled end of the optical fibers to a light source, and (c) an illuminating surface attached to the decorative member with the film piece between the illuminating surface and the back



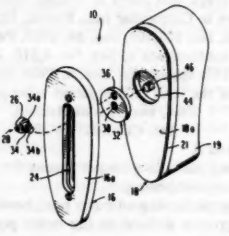
side of the decorative member, the illuminating surface being formed by the optical fibers which are arranged in parallel relation and provided with notched portions through which light conducted through the optical fiber passes and illuminates the film piece, the indicia being formed by openings in a no-light-passing layer applied on the film piece and wherein a light-passing metallic layer is attached to the film piece.

5,009,021

ADJUSTABLE GUN BUTT

Jerry T. Nelson, Rte. 2, Box 116, Cherokee, Ala. 35616

Filed Mar. 21, 1990, Ser. No. 496,713
Int. Cl.[5] F41A *23/20*
U.S. Cl. 42—73 4 Claims



1. An adjustable gun butt assembly comprising:

first and second face abutting plates having respective front and rear faces, said first plate adaptable to be fixed via said front face to a rear face of a gun stock,

a slot in said first face of said first plate adapted to receive and slidably retain the head of a shoulder bolt therein,

a circular recess within said front face of said second plate,

a rotatable cam disk of a diameter slightly smaller than said

circular recess and positioned therein for rotation about coincident axes of the cam disk and circular recess,

a first tapped hole within the center of said rotatable cam disk,

a second tapped hole within said rotatable cam disk eccentric to said first tapped hole,

a hole extending through said second plate coaxial with said circular recess,

a resilient shoulder pad having a front face affixed to said rear face of said second plate, and having a hole passing from a rear face of said pad to said pad front face, therethrough parallel to and positionable in line with said hole extending through said second plate, and

an adjusting set screw having a head and a threaded shank with said threaded shank sized to and threaded into said first tapped hole in said rotatable cam disk,

said shoulder bolt having a threaded shank of predetermined length, and being threaded into said eccentric second tapped hole of said rotatable cam disk such that said shoulder bolt slides freely within said slot of said first plate when said set screw is loosened, and

wherein the thickness of said rotatable cam disk is less than the depth of said circular recess receiving the same whereby, with said set screw threaded shank backed out of said first tapped hole, said second plate and said shoulder pad are free to move relative to said first plate and gun stock orthogonally by rotation of said shoulder bolt eccentrically about the axis of said rotatable cam disk as the disk rotates within said circular recess of said second plate and by movement said shoulder bolt independently over the length of said elongated slot, and

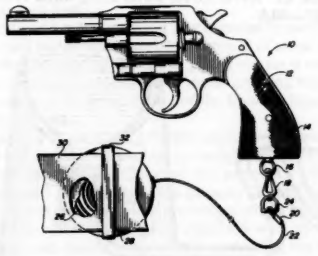
wherein upon tightening down said set screw, said rotatable cam disk is pulled deeper into said circular recess, causing the shoulder bolt head to drive said first plate into frictional engagement with said second plate to lock said plates together.

5,009,022

GUN SAFETY ASSEMBLY

Fred McCoy, 7050 N. Hwy. 1247, Science Hill, Ky. 42553

Filed Mar. 9, 1990, Ser. No. 490,884
Int. Cl.[5] F41A *35/00*
U.S. Cl. 42—094 **8 Claims**



8. An improved method of providing a brace for a person using a gun to steady the gun, comprising:

(a) providing a reel bearing an elongated cord and spring means biasing said cord towards said reel wherein the length of said cord is just sufficient to extend said gun at arms length from said casing when on said gun belt and wherein the bias of said spring on said cord and gun is sufficient so as to help brace and steady said gun to assist accurate shooting thereof;

(b) providing means for releasably connecting said reel to a belt of the person; and,

(c) interconnecting the weapon to said cord;

(d) whereby said cord serves as a brace to steady the gun when being prepared for firing.

5,009,023

HIGH SPEED FISHING LURE

Donald A. Hoyt, Fulton, N.Y., assignor to Attacher Lures, Fulton, N.Y.

Filed Nov. 20, 1989, Ser. No. 438,864
Int. Cl.[5] A01K *85/00*
U.S. Cl. 43—42.5 **8 Claims**

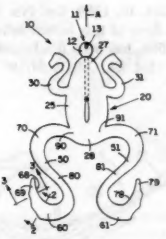
1. A high-speed spoon-type fishing lure for use at high trolling or retrieval speeds up to at least about 7 knots comprising a rounded, elongated metal plate having a trailing end and a leading end and which is narrower at the leading end and broader at the trailing end, and wherein the metal plate is of tapered thickness from front to back such that the trailing end is substantially thicker than the leading end to concentrate the weight of the metal plate at the thicker, broader trailing end to inhibit rotation or spinning of the lure at said high trolling or retrieval speeds; a hook attached onto said metal plate; and means of said leading end for attaching to a fishing line.

5,009,024

ARTIFICIAL LURE SIMULATING FROG MOVEMENTS

Steven E. Parman, 223 Roy St., Kerrville, Tex. 78028

Filed Aug. 31, 1989, Ser. No. 401,051
Int. Cl.[5] A01K *85/00*
U.S. Cl. 43—42.3 **8 Claims**



7. A flexible lure member for use in an artificial lure to simulate the swimming motion of a frog comprising:

a body which is adaptable to be connected to a fishing line for drawing said body through water in a direction of travel forward relative to said body;

a pair of elastically flexible appendages attached to the rear of said body, each of said appendages having an S-shape and having a foot member at the distal end thereof, wherein:

said foot member is biased transversely relative to said forward direction; and

said foot member has a leading edge which is biased to face said forward direction of travel, the profile height of the leading edge being biased perpendicular to said forward direction of travel and said profile height of the leading edge is at least fifty percent greater than the average thickness of said foot member.

5,009,025

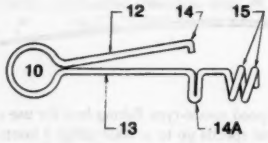
QUICK TIE DEVICE

Grover R. Austad, 101 Riverview C, Great Falls, Mont. 59404

Continuation-in-part of Ser. No. 190,345, May 5, 1988, abandoned. This application Aug. 21, 1989, Ser. No. 396,801

Int. Cl.[5] A01K *91/00*

U.S. Cl. 43—44.83 1 Claim



1. A quick tie link and fishing device for providing a knotless non-slip wrapping for a flexible line on said fishing device comprising,

an elongated form made from a single piece of wire material having a helix at one end of said elongate form connected to a closed "U" snubbing post that is formed at a substantially 90 degree angle to said elongate form; said snubbing post being located a distance from the helix approximately equal to the height of said snubbing post, the diameter of said helix being approximately equal to the height of said snubbing post; a first straight shank portion which extends from said snubbing post to a loop;

a second shank connected to said loop, said second shank being substantially parallel to said first shank portion and second shank extends from said loop to said snubbing post where said second shank terminates in a post which is perpendicular to said second shank.

5,009,026

FISH HOOK INCLUDING AN IMPROVED BAIT GUARD WITH A SLIDER

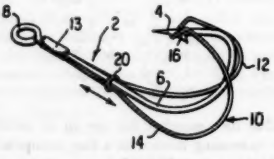
Newsome E. Corbitt, III., 3724 Beauclerc Rd., Jacksonville, Fla. 32217

Filed Oct. 10, 1989, Ser. No. 418,875

The portion of the term of this patent subsequent to Dec. 22, 2004, has been disclaimed.

Int. Cl.[5] A01K *83/06*

U.S. Cl. 43—44.8 17 Claims



1. A fish hook including a bait guard, said fish hook comprising a rearward eye portion, an intermediate shank portion, and a forward hook portion, said bait guard comprising means for keeping bait on the hook, comprising:

an elongated flexible member secured to the eye portion, extending forwardly along a side of the shank portion, following the curve of the hook portion and extending rearwardly to and in releasable engagement with a barbed point on the end of the hook portion, and

means for sliding encircling the flexible member and the shank portion of the fish hook movable along the hook between the eye portion and the hook portion,

whereby said sliding means is positioned adjacent bait held on the hook to secure said bait on the hook.

5,009,027

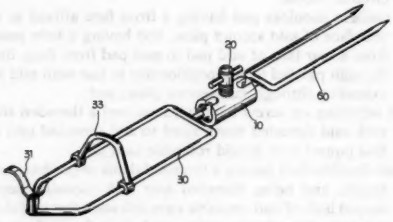
FISHING ROD HOLDER

Guo-Shin Lee, No. 26, Chien-Te Street, Taichung City, Taiwan

Filed Jan. 12, 1990, Ser. No. 464,376

Int. Cl.[5] A01K *87/00*

U.S. Cl. 43—21.2 2 Claims



1. A fishing rod holder comprising:

A pivot member including a cylindrical portion having an axially directed through opening and a bolt hole wherein a plurality of steel balls are positionally located within the cylindrical portion through opening, and a bolt threadedly fixed to the cylindrical portion within the bolt hole;

a holster member including a bracket, an adjustable support and a ball head,said ball head insertable within said pivot member through opening and pivoted to a first end of said pivot member with a first ball head holder and a first C-ring; and,

a stake member including a ball head formed on a first end thereof and a fork-like device at a second end thereof, said stake member ball head inserted and pivoted to a second end of said pivot member with a second ball head holder and a second C-ring.

5,009,028

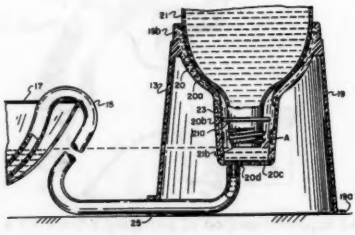
APPARATUS FOR SUPPLYING WATER CONTINUOUSLY TO TREE STAND

Moises B. Lorenzana, 601 Lake Hinsdale Dr., Willowbrook, Ill. 60559, and Vance A. Lorenzana, 698 Spring Hill Cir., Naperville, Ill. 60540

Filed Oct. 19, 1987, Ser. No. 109,860

Int. Cl.[5] A47G *33/12*; B67D *5/06*; A01K *7/00*

U.S. Cl. 47—40.5 1 Claim



1. A continuous watering apparatus for use with a tree stand which mounts a cut tree vertically with the severed trunk end immersed in water to prevent the tree from drying out comprising a reservoir having a base for supporting said reservoir on a horizontal surface adjacent said tree stand, said reservoir having walls defining an upwardly facing recess, means in said recess engaging and supporting in an upended position a water bottle, said bottle having a mouth which in said upended position is spaced above the bottom of said recess, an elongated flexible water supply tube connected to said reservoir at the bottom of said recess, said reservoir supporting the mouth of said bottle at a height equal to the desired water level in said

tree stand whereby through a siphon action said reservoir will supply water continuously to said tree stand until the water is drained from said bottle, said recess having an upper portion of generally hemispherical shape and a lower portion which is generally cylindrical, terminating in said bottom of said recess, said upper and lower portions being sized to detachably receive said bottle, said bottle having a neck extending into said lower portion with the mouth of said bottle spaced above said bottom, a plurality of projections on said walls of said recess to space said bottle from said walls to permit air to enter said bottle as the water level drops below said bottle mouth in said lower portion of said recess, said projections comprise peripherally spaced ribs which extend from the top of said recess to the bottom.

5,009,029

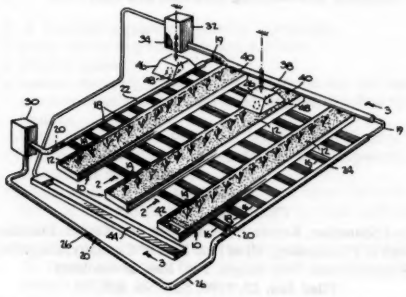
CONDUCTIVE TEMPERATURE CONTROL SYSTEM FOR PLANT CULTIVATION

Seymour I. Wittlin, 4951 Debs Way, Oceanside, Calif. 92056

Continuation of Ser. No. 69,831, Jul. 6, 1987, abandoned. This application Mar. 10, 1989, Ser. No. 323,038

Int. Cl.[5] A01G *31/00*

U.S. Cl. 47—62 **8 Claims**



1. A method for growing plants which comprises the steps of:

(a) placing a plant growing medium and plants in a metal growing tray;

(b) flowing in a closed metal piping system a liquid which will absorb heat;

(c) placing said metal growing tray in metal to metal contact with said metal piping system by means of metal supports and disposed so that said metal piping system is external to and structurally supports said metal growing tray;

(d) controlling the temperature of the flowing liquid in said piping system;

(e) flowing a liquid plant nutrient solution from outside the growing tray onto the plant growing medium; and

(f) controlling the temperature of said nutrient solution from outside said growing tray and prior to flowing said nutrient solution onto said plant growing medium by placing in conductive heat exchange relationship with the nutrient solution said metal piping system containing the temperature-controlled liquid.

5,009,030

SUBSTRATE FOR SOIL-FREE CULTURE HAVING A CONTROLLED WATER CONTENT OVER ITS THICKNESS

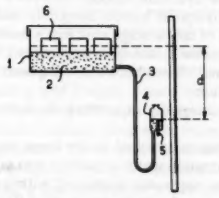
Bernard Kafka, Rantigny, and Michel Baufume, Barbery, both of France, assignors to Isover Saint-Gobain, Aubervilliers, France

Filed Oct. 3, 1988, Ser. No. 251,831

Int. Cl.[5] A01G *31/00*

U.S. Cl. 47—64 **14 Claims**

1. Substrate for soil-free cultivation formed from a felt of mineral fibres, suitable for the supply of water or an aqueous nutrient solution to plants, comprised of a porous, fibrous felt having opposed major first and second surfaces, said first surface being above said second surface when said felt is horizontally disposed as a substrate for soil-free cultivation, wherein said felt has a heterogeneous fibrous structure displaying a hydroretentivity gradient such that the hydroretentivity gradient decreases in the direction from said first surface to said second surface, such that said gradient is opposed to the direction of gravity when said substrate is horizontally disposed and employed as a substrate for soil-free cultivation.



5,009,031

GROW-MAT FOR CULTIVATING PLANTS AND A METHOD FOR MANUFACTURING SAME

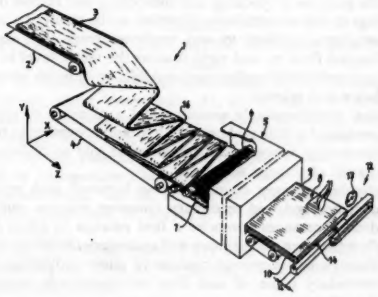
Albert W. Knop, Herkenbosch, and Robert J. H. M. van Banning, Munstergeleen, both of Netherlands, assignors to Rockwool Lapinus B.V., Netherlands

Continuation of Ser. No. 145,615, Jan. 19, 1988, abandoned. This application Oct. 17, 1989, Ser. No. 423,620

Claims priority, application Netherlands, Jan. 27, 1987, 8700196

Int. Cl.[5] A01G *31/02*

U.S. Cl. 47—64 **13 Claims**



1. Grow-mat for cultivating plants, comprising a layer of mineral fibres cross-linked to one another by cured binding agent and treated with hydrophilic wetting agent, characterized in that in said grow-mat the principal direction of said mineral fibres extending in said layer extends in the longest dimension of said mat and the subsidiary direction of said mineral fibres extending in said layer extends in the heightwise dimension of said mat.

5,009,032

PORTABLE AUTOMATIC WATER-RELEASING PLANT RECEPTACLE

Etheridge C. Hogue, 198 Pine Street, SW., Bessemer, Ala. 35020, assignor to Etheridge C. Hogue, Birmingham, Ala.

Filed Oct. 31, 1988, Ser. No. 264,994

Int. Cl.[5] A01G *25/00, 29/00*

U.S. Cl. 47—79 **8 Claims**

1. A portable automatic water-releasing plant receptacle comprising a receptacle housing integrally containing;

a liquid storage tank for holding water to be delivered to a planter portion integrally attached thereto;

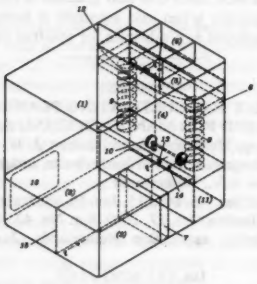
an accumulation chamber having an inlet opening and a plurality of release openings and situated in the top portion of said storage tank to release water into said planter portion;

a dual chamber hydraulic system wherein a primary chamber of said hydraulic system integrally makes up the bottom portion of said storage tank and a secondary chamber is situated beside a storage compartment, separated by a common wall there-between, disposed beneath said planter portion;

a hollow base integrally supporting the bottom of said storage tank;

an elastic container attached to the inner walls of said storage tank to contain water as poured into said storage tank;

a water release apparatus contained within said accumulation chamber, and comprising a rigid float, fitted with a second buoyant flanged top-and-bottom float (embedded



with a first magnet to be attracted by a second magnet situated on the outside of said accumulation chamber) for the purpose of blocking and unblocking said release openings of said accumulation chamber as the result of a buoyant force applied to and removed from said second flanged float by said rigid float as the water level in said accumulation chamber rises and falls upon water accumulation and release;

a dual wheel-and-axle assembly and a plurality of springs contained within said primary hydraulic chamber to transfer energy between said primary and said secondary hydraulic chambers; and

hydraulic passages communicating between said primary chamber and said secondary chamber wherein said hydraulic passages comprise a first passage to allow fluid flow between said primary and secondary chambers therethrough and a second passage to allow movement of a secondary cable of said dual wheel-and-axle assembly therethrough.

5,009,033

GROUND COVER SHEET

Leonard A. McCray, 20817 NE. 87 Ave., Battle Ground, Wash. 98604

Filed Nov. 16, 1987, Ser. No. 121,280

Int. Cl.[5] A01G *9/02*; B32B *3/10*

U.S. Cl. 47—80 **10 Claims**

1. A new and improved ground cover sheet for retaining bark dust and bark chips, comprising:

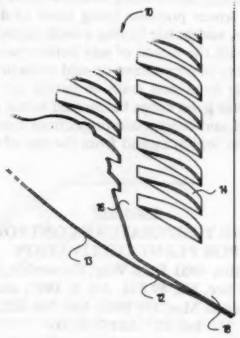
an elongated base sheet formed from a flexible plastic material;

an elongated cover sheet formed from a flexible plastic material and overlying said base sheet;

a plurality of spaced heat weld zones extending across the width of said cover sheet, securing said cover sheet to said base sheet;

a plurality of short slits in said cover sheet extending along a length of said cover sheet;

said slits arranged in rows of spaced slits across the width of said cover sheet; and



said slits forming a plurality of upwardly convex bows for engaging and retaining bark dust and bark chips.

5,009,034

CLOSURE SUPPORT

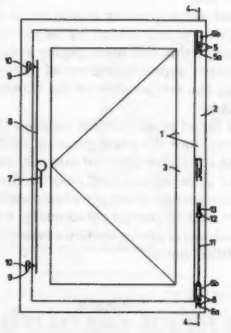
Alfred Schneider, Kreutzal; Horst Loos, and Karl H. Fischbach, both of Freudenberg, all of Fed. Rep. of Germany, assignors to Siegenia-Frank KG, Siegen, Fed. Rep. of Germany

Filed Jan. 23, 1990, Ser. No. 468,705

Claims priority, application Fed. Rep. of Germany, Jan. 24, 1989, 3901944; Mar. 23, 1989, 8903678; Jun. 22, 1989, 3920360

Int. Cl.[5] E05D *15/52*

U.S. Cl. 49—192 **11 Claims**



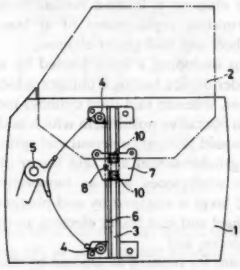
1. A window or door with a panel mounted on a fixed frame by hinge fittings near a vertical panel element, characterized by a brace engaged with the panel adjacent to the hinge fittings which comprise upper and lower corner hinges and anchored to the fixed frame against the force of gravity or direction of load of the panel wherein the window or door has a tilt panel and further characterized by the fact that the brace is located between the panel and the frame above, but near, the lower corner hinge.

5,009,035

WINDOW REGULATOR APPARATUS

Nobuyuki Kuki, Toyohashi; Yukio Isomura, Chiryu; Hirokazu Suzumura, Toyota; Yoshikazu Sakakibara, Anjo, and Hiroshi Ishihara, Kariya, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Japan

Filed Mar. 28, 1990, Ser. No. 500,204
Claims priority, application Japan, Mar. 29, 1989, 1-35805[U]
Int. Cl.[5] E05F *11/48*
U.S. Cl. 49—352 7 Claims



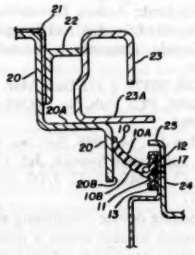
1. A window regulator apparatus, comprising:
a guide rail having inner vertical surfaces;
a window glass;
a bracket movably supported on said guide rail and having outer vertical surfaces, said window glass attached to said bracket;
driving means for moving said bracket and thereby said window glass along said guide rail in an upward and downward direction;
resilient means positioned between said inner vertical surfaces of said guide rail and said outer vertical surfaces of said bracket; and
shoes interposed between said resilient means and guide rail for compressing said resilient means in two directions to reduce rattling of the window.

5,009,036

BOX CAR DOOR SEAL

Walter S. Ryan, Mercer, Pa., assignor to Pennsylvania Rail Car Company, Mercer, Pa.

Continuation-in-part of Ser. No. 410,273, Sep. 21, 1989, abandoned. This application May 11, 1990, Ser. No. 522,214
Int. Cl.[5] E06B *7/23*
U.S. Cl. 49—485 1 Claim



1. In the combination of a box car construction having a door frame including a vertically disposed sealing surface, a box car door having a vertical flange spaced with respect to said vertically disposed sealing surface of said box car door frame, the box car construction having a normal condition in which the door frame vertically disposed sealing surface is spaced from the box car door by a preset distance and a sprung condition in which the door frame vertically disposed sealing surface is spaced from the box car door by a distance which differs from the preset distance, and an improved sealing device for sealing the space between the vertical sealing surface of said box car door frame and said flange of said box car door, the improvement comprising: an elongated deformable resilient sealing member, a bifurcated base section of a known width on one longitudinal edge of said elongated sealing member forming oppositely disposed extending flanges on said sealing member, a continuous elongated cavity in said base section partially separating said flanges, a longitudinally extending bore in said sealing member at the point of bifurcation partially separating said flanges, means mounting said sealing member on said flange of said box car door with said elongated deformable resilient sealing member in engagement with said vertical sealing surface of said door frame, said sealing member extending outwardly and upwardly from said bore in a shallow curve and having a convex surface which contacts said vertically disposed sealing surface and forms a fluid tight seal, a substantial portion of said sealing member convex surface engaging said vertical sealing surface of said door frame when said box car construction is in the normal condition, said sealing member having a concave surface which defines a trough for directing liquid away from said vertical flange of said door frame, said longitudinally extending bore being sized so that there is only enough material in said deformable resilient sealing member and base surrounding said bore to provide the sealing member with sufficient flexibility to maintain enough of the convex surface in contact with the vertical sealing surface to maintain said fluid tight seal with the vertically disposed flange when the box car construction is in the sprung condition as well as maintaining said convex surface in flush contact with the vertically disposed surface when the box car construction is in the normal condition.

5,009,037

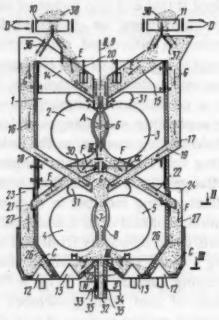
APPARATUS FOR DESCALING THE SURFACE OF A STRIP

Jury V. Lipukhin, ploschad Metallurgov, 5, kv. 15; Leonid I. Danilov, ulitsa Vereschagin, 51, kv. 8; Albert N. Ivoditov, ploschad Metallurgov, 5, kv. 13; Eduard A. Garber, ulitsa M. Gorkogo, 85, kv. 17; Anatoly N. Subbotin, prospekt Pobedy, 120, kv. 14; Valentin P. Pavlov, prospekt Pobedy, 57, kv. 30, all of Vologodskaya oblast, Cherepovets; Jury K. Zhukov, Serpukhovskoi val, 13, kv. 29, and Alexandr F. Pimenov, ulitsa Planernaya, 12, korpus 1, kv. 400, both of Moscow, all of U.S.S.R.

PCT No. PCT/SU88/00092, § 371 Date Dec. 21, 1988, § 102(e) Date Dec. 21, 1988, PCT Pub. No. WO88/08341, PCT Pub. Date Nov. 3, 1988
PCT Filed Apr. 20, 1988, Ser. No. 294,510
Claims priority, application U.S.S.R., Apr. 21, 1987, 4225033; Dec. 21, 1987, 4340096
Int. Cl.[5] B24B *19/00*
U.S. Cl. 51—7 6 Claims

1. An apparatus for descaling the surface of a strip comprising a chamber to be filled with an abrasive powder accomodating at least first and second pairs of mechanisms for compacting the powder arranged one above the other, working members of said first and second pairs of mechanisms for compacting facing a plane along which the strip is conveyed to define work spaces between the working members and the plane of the strip, means for charging the abrasive powder from above to the chamber, and first and second gates for discharging the powder from the chamber provided at the bottom portion thereof, characterized in that said apparatus for descaling includes first and second systems of conduits for separately delivering the abrasive powder from the charging means to the work spaces between the working members of the powder

compacting mechanisms and said plane of the strip, and a third system of conduits for separately evacuating the powder from



said work spaces to the first and second gates for discharging the powder from the chamber.

5,009,038

AUTOMATIC CHAMFERING MACHINE

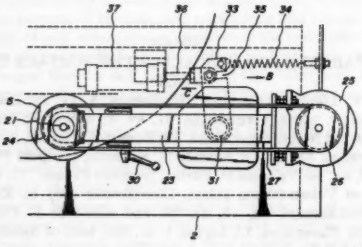
Akira Yoshikawa, Nagoya, and Setsuo Torikai, Konan, both of Japan, assignors to NKG Insulators, Ltd., Nagoya, Japan

Continuation of Ser. No. 318,420, Feb. 28, 1989, abandoned, which is a continuation of Ser. No. 88,519, Aug. 20, 1987, abandoned, which is a continuation of Ser. No. 837,262, Mar. 7, 1986, abandoned. This application Jul. 16, 1990, Ser. No. 552,836

Claims priority, application Japan, Mar. 20, 1985, 60-54169

Int. Cl.[5] B24B *9/00*

U.S. Cl. 51—126 **2 Claims**



1. A machine for chamfering workpieces which have a thinwalled ceramic honeycomb structural body with at least one end surface to be chamfered, comprising:

a machine frame;

a turntable supported by said machine frame so as to be rotatable about a vertical axis and having a horizontal upper surface which supports the workpieces in which a plurality of openings are provided, said turntable being driven intermittently to successively feed the workpieces to a predetermined position;

a clamping device connected to said machine frame and including a pair of vertically opposed discs for clamping each of the workpieces when at the predetermined position, such that there is a substantial radial overhang of each of the workpieces with respect to the discs, vertically deplacing each of the workpieces from said upper surface through the openings, and rotating each of the workpieces in one direction about an axis of rotation of each of the workpieces which extends substantially at a right angle to the end surface of each of the workpieces;

a grinder wheel for chamfering the end surface of each of the workpieces, said grinder wheel being detachably mounted on one end of a rotational shaft which is parallel to said axis of rotation and movable in a direction substantially perpendicular to said axis of rotation;

a tracer element for tracing the outer peripheral contour of each of the workpieces, said tracer element being smaller in radius than said grinder wheel and arranged coaxially therewith during chamfering so as to be movable in a direction substantially perpendicular to said axis of rotation, said tracer element being mounted on a bracket which is movable between an operative position in which said tracer element is located close to, and coaxially with, said grinder wheel and an inoperative position in which said tracer element is located remote from said grinder wheel permitting replacement of at least one of said grinder wheel and said tracer element;

biasing means including a lever loaded by a spring and a fluid cylinder device having a plunger which is connected to said lever, wherein said fluid cylinder moves said lever between an operative position, in which said lever is disengaged from said plunger to permit said spring to resiliently urge said grinder wheel and said tracer element toward each of the workpieces, and an inoperative position, in which said lever is engaged by said plunger to move said grinder wheel and said tracer element away from each of the workpieces; and

abutment means for limiting an amount by which said spring resiliently urges said grinder wheel and said tracer element toward each of the workpieces, said abutment means having a slit formed therein in which an end of said plunger is movably engaged, said slit having a least one closed end for preventing said lever from rotating beyond a position in which the end of said plunger abuts against the closed end of said slit;

wherein said grinder wheel and said tracer element are operatively associated with each other such that said tracer element, while tracing the outer peripheral contour of each of the workpieces, controls the movement of said grinder wheel toward and away from said axis of rotation of effect an autoprofiling chamfering of the end surface of each of the workpieces.

5,009,039

SKATE SHARPENING DEVICE

Kjell Lager, Österbybruk; Anders Tärnström, Storvreta; Olov Östlund, Uppsala, all of Sweden, and Joseph W. Driver, Hudson Heights, Canada, assignors to Svenska Skatebox AB, Uppsala, Sweden

PCT No. PCT/SE88/00379, § 371 Date Mar. 16, 1990, § 102(e) Date Mar. 16, 1990, PCT Pub. No. WO89/00443, PCT Pub. Date Jan. 26, 1989

PCT Filed Jul. 14, 1988, Ser. No. 458,624

Claims priority, application Sweden, Jul. 17, 1987, 8702909

Int. Cl.[5] B24B *49/12, 3/00, 19/00*

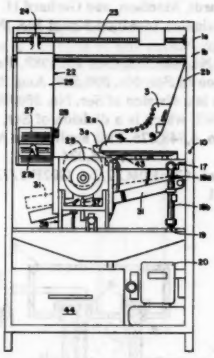
U.S. Cl. 51—165.77 **10 Claims**

1. A skate sharpening device comprising an automatic skate sharpening mechanism located inside a protective cover, including a skate loading device (2), which is pivotally mounted in an opening (9) in said protective cover (1), so that it can be pivoted between a skate loading position outside said protective cover (1) and a starting position for sharpening inside said protective cover (1), said skate loading device comprising:

(a) gripping means (12, 15) for releasably gripping at least one skate (3) to be sharpened,

(b) first obturation means (11*a*) which substantially close

said opening (9) in said skate loading position (FIG. 5), and



(c) second obturation means (11*b*) which substantially close said opening (9) in said starting position for sharpening (FIG. 6).

5,009,040

BLADE SHARPENER

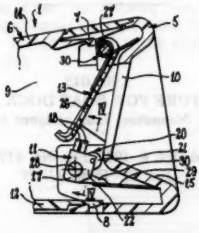
Cvetan Petroff, Kew, Australia, assignor to McPherson's Limited, Australia

Filed Aug. 17, 1990, Ser. No. 569,084

Claims priority, application Australia, Aug. 28, 1989, PJ6017; Feb. 1, 1990, PJ8419

Int. Cl.[5] B24B *33/00*

U.S. Cl. 51—214 **18 Claims**



1. A blade sharpener including, a sharpening mechanism which is operable to sharpen the cutting edge of a blade engaging that mechanism and being moved longitudinally relative thereto,

sharpening defeating means connected to a support for movement relative thereto between an operative condition and an inoperative condition,

said defeating means being arranged to adopt said operative condition in response to longitudinal movement of said blade through the sharpener in one direction, said defeating means being operative to apply a force against said blade acting counter to a force causing said blade to engage said mechanism when said defeating means is in said operative condition,

and said defeating means being arranged to adopt said inoperative condition in response to said longitudinal movement of the blade in a direction opposite to said one direction, said defeating means not being operative to apply said counter force to said blade when said defeating means is in said inoperative condition.

5,009,041

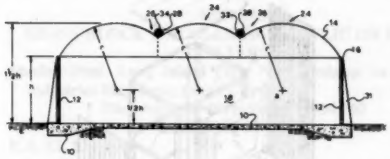
WEIGHTED MEMBRANE STRUCTURES

Anderson B. Fly, Amarillo, Tex., assignor to Fly Enterprises, Inc., Amarillo, Tex.

Filed Aug. 3, 1982, Ser. No. 404,879

Int. Cl.[5] E04G *11/04*; E02D *29/00*

U.S. Cl. 52—2.19 **6 Claims**



1. A membrane covered permanent structure built on ground having

a. a peripheral wall connected to

b. a foundation on the ground,

c. a flexible membrane having a periphery connected to the wall,

d. the foundation having floor area below the membrane and within said peripheral wall,

e. said membrane being supported at an approximate desired membrane height above the floor area by fluid exerting internal fluid pressure under the membrane greater than fluid exerting external fluid pressure above the membrane,

wherein the improved structure comprises in combination with the above:

f. at least one weight connected to the membrane within the periphery,

g. said internal fluid pressure also supporting said weight by the intervening support of the membrane,

h. said weight depressing the membrane such that a radius of curvature of the membrane between the periphery and weight is less than the radius of curvature of a fully inflated condition,

i. whereby the membrane and weights move up and down from the approximate desired membrane height solely responsive to the changing fluid pressures above and below the membrane,

j. said membrane having restraining connection to the peripheral wall only.

5,009,042

MODULAR DISPLAY SYSTEM

Bruno Sacco; Johann Tomforde, both of Sindelfingen; Thomas Abb, Klingenberg, and Bruno Stenemann, Beckum, all of Fed. Rep. of Germany, assignors to Daimler-Benz AG

Continuation of Ser. No. 241,267, Sep. 7, 1988, abandoned. This application Nov. 30, 1989, Ser. No. 443,040

Claims priority, application Fed. Rep. of Germany, Sep. 7, 1987, 3729903

Int. Cl.[5] E04B *2/00*; E04H *1/00*

U.S. Cl. 52—36 **3 Claims**

1. A modular display comprising:

a wall element having vertical interior profiles arranged at lateral corner regions of the wall element and a horizontal elongated, profile extending between the vertical profiles;

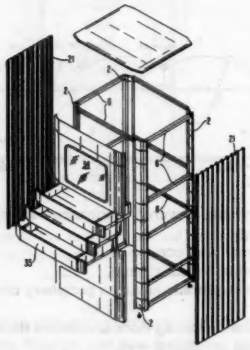
a first contact surface of each of the vertical profiles for contacting the horizontal profile, the first contact surface extending at a right angle to a longitudinal axis of the horizontal profile;

a second contact surface of each of the vertical profiles for contacting one of an additional horizontal profile and a mirror inverted vertical profile for forming a free standing wall, the second contact surface extending parallel to the longitudinal axis of the horizontal profile;

a housing channel of the vertical profiles facing outwardly

from the wall element and extending in a longitudinal direction of the vertical profiles; and

a rigid covering for attaching to the horizontal and vertical profiles to form an exterior of the wall element, wherein the rigid covering is formed by segments arranged superposed at a mutual interval, and wherein stirrups, which



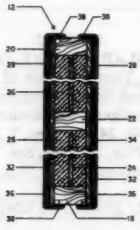
are respectively attachable to a mid-region of each of the vertical profiles positioned between the first and second contact surfaces of each of the vertical profiles, pass through a gap present between the segments and are slidable on shelves attached to the wall element which each have at least one interior guide channel for this purpose.

5,009,043

ACOUSTIC PANEL

Andrew J. Kurrasch, Saugatuck, Mich., assignor to Herman Miller, Inc., Zeeland, Mich.

Filed Jul. 12, 1990, Ser. No. 551,916
Int. Cl.[5] E04B *1/82, 1/84*
U.S. Cl. 52—145 **22 Claims**



1. In an acoustic wall panel comprising a peripheral frame having opposed sides and defining an opening, a septum mounted in said opening to restrict sound transmission therethrough, an inner sound-absorbing filling received within said opening, a rigid perforated facing secured to each side of said peripheral frame to permit sound to pass therethrough and to rigidify said frame, and an outer decorative fascia secured to said frame,

the improvement which comprises:

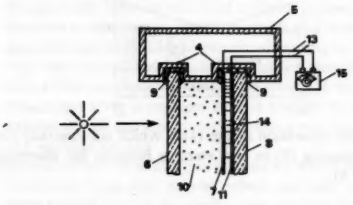
a sound-transmitting spacer layer overlying each facing and a thin gas impervious foil layer overlying said sound-transmitting spacer layer layer to provide fire retardancy to said panel.

5,009,044

DUAL-PANE THERMAL WINDOW WITH LIQUID CRYSTAL SHADE

Ray H. Baughman, Morris Plains; Ernest D. Buff, Far Hills; Helmut Eckhardt, Madison, and Gerhard H. Fuchs, Far Hills, all of N.J., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Division of Ser. No. 425,263, Oct. 23, 1989, Pat. No. 4,964,251, which is a division of Ser. No. 398,599, Aug. 25, 1989, Pat. No. 4,899,503, which is a division of Ser. No. 350,808, May 12, 1989, Pat. No. 4,893,902, which is a division of Ser. No. 66,299, Jun. 25, 1987, Pat. No. 4,848,875. This application Apr. 26, 1990, Ser. No. 515,034
Int. Cl.[5] E04C *2/54*; G02F *1/133*
U.S. Cl. 52—171 **1 Claim**



1. A thermal-pane window unit resistant to radiative heat transfer as well as conductive heat transfer, comprising:

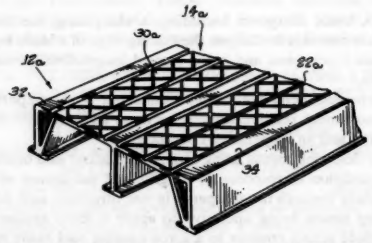
two substantially parallel, spaced window panes, mounted in a window frame, a first of said panes being composed of plastic, being adaptive to be electrically conductive and including, as a microdispersion within said plastic, an electro-optical liquid crystal material providing a selected light transmittance, and a second of said panes delimiting, said first of said panes, a space providing a thermal break.

5,009,045

PLANK STRUCTURE FOR BOAT DOCK AND THE LIKE

Dennis G. Yoder, Nappanee, Ind., assignor to CTB, Inc., Milford, Ind.

Filed Oct. 6, 1989, Ser. No. 417,827
Int. Cl.[5] E04F *11/16*
U.S. Cl. 52—177 **13 Claims**



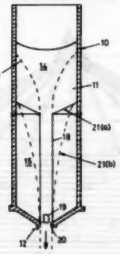
1. A plastic plank member for a deck or the like integrally formed of a plastic material having a coefficient of friction less than approximately 0.5, said plank member comprising: a top portion formed of a first material and tread means formed of a second material integral with said top portion, said tread means having a coefficient of friction generally greater than 0.5, fluid drainage means for draining fluid from said tread means and from said top portion of said plank.

5,009,046

REDUCING HOOP STRESS IN SILOS

Bruce L. Johinke, Kent Town, Australia, assignor to South Australian Co-Operative Bulk Handling Limited, Adelaide, Australia

Filed Apr. 23, 1985, Ser. No. 726,030
The portion of the term of this patent subsequent to Dec. 13, 2005, has been disclaimed.
Int. Cl.[5] B65G 63/34
U.S. Cl. 52—197 9 Claims



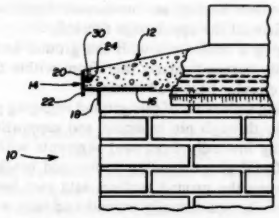
1. Means for reducing hoop stress in a silo of the type having cylindrical walls upstanding from a base and defining therewith a cell, comprising a grain tube located centrally within the silo and having a tube wall upstanding from the silo base and extending part way up the silo cell, the grain tube having an open upper end and an open lower end, apertures through the wall of the tube near said lower end and symmetrical about the central vertical axis of the tube, a restrictor beneath the apertures for restricting flow of grain through the tube, a gate valve at the lower end of the tube vertically below the restrictor, and support means supporting the upper end of the tube from said cylindrical silo walls.

5,009,047

CHIMNEY CROWN MOLD

Michael Olding, 4 Gilmore Ct., Fairfield, Ohio 45014

Continuation of Ser. No. 277,880, Nov. 30, 1988, abandoned.
This application May 14, 1990, Ser. No. 523,014
Int. Cl.[5] E04H 12/28; F23L 17/12
U.S. Cl. 52—218 7 Claims



1. A chimney crown mold for use in combination with a chimney which includes a chimney shell and a chimney crown disposed on top of said chimney shell, said chimney crown mold being adapted for installation between said chimney shell and said chimney crown so that said chimney crown overhangs said chimney shell, and wherein said chimney crown mold deflects water which infiltrates said chimney crown away from said chimney shell thus reducing or helping alleviate water infiltration into said chimney shell, said chimney crown mold comprising:

a base which contacts and covers a top surface of said chimney shell, and a band extending downwardly substantially perpendicular to said base for contacting an outer side surface of said chimney shell, said base having an inner end and an outer end, said band being located between said inner and outer ends but closer to said outer end than to said inner end;

an upper leg extending upwardly from said base adjacent the outer end thereof without forming any notches, grooves or recesses between said upper leg and said base, said upper leg cooperating with said base to contain said chimney crown; and

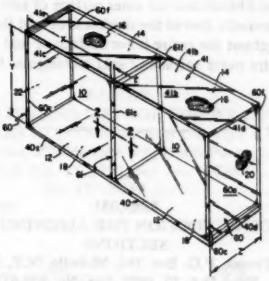
a lower leg extending downwardly from said base adjacent the outer end thereof to prevent water that runs off said chimney crown from dipping underneath said chimney crown mold.

5,009,048

GLASS BLOCK WALLS USING ACRYLIC OR GLASS FILTERS

Stanley Paul, Long Island City, N.Y., assignor to Acrymet Industries Inc., Long Island City, N.Y.

Filed Aug. 15, 1989, Ser. No. 394,353
Int. Cl.[5] E04G 21/18
U.S. Cl. 52—308 7 Claims



1. An array of translucent blocks, comprising:

a plurality of translucent blocks arranged in horizontal rows and vertical columns;

horizontal and vertical transparent plastic filler pieces between adjacent blocks, said plastic filler pieces extending at least across the entire length or height of the adjacent blocks, the width of said filler pieces being substantially equal to the width of said translucent blocks, each said plastic filler piece including at least one edge that is visible as part of said array, the edges of said plastic filler pieces that are visible being sufficiently smooth so as to be transparent, whereby the material between said blocks that is visible appears to be transparent; and

adhesive means for securing each filler piece to the contiguous surfaces of adjacent one of said translucent blocks.

5,009,049

Patent Not Issued For This Number

5,009,050

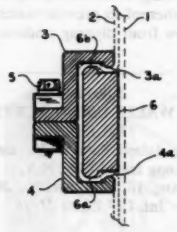
ROOFING CLAMP

Milan A. Gruber, Monaca, Pa., assignor to Ed. Shook, Jr., Pittsburgh, Pa.

Filed May 15, 1990, Ser. No. 511,753
Int. Cl.[5] E04D 5/14
U.S. Cl. 52—408 3 Claims

1. In combination with an impervious flexible roofing sheet, a clamp for clamping said sheet to a roof in a rain-tight manner, comprising a pair of Z-like clamp halves, each having three legs att right angles to each other, one of the ends of each leg having an inward extending, substantially semicircular projection, a rectangular block attached to the roof and having a pair of outward extending, substantially semi-circular projections outwardly of said roof, machine screws for detachably fastening the other of said three legs in abutting relationship and in spaced surrounding relationship to said rectangular block

sufficiently to accommodate a portion of said flexible roofing sheet in surrounding relationship to the exposed surface of said rectangular block so that each of said block form an S-like path to said portion of said roof sheet, the spacing between the outer



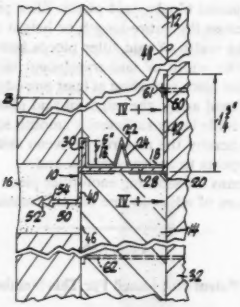
surface of said block and the inner surface of said clamp halves being substantially that of the thickness of said flexible roofing sheet throughout the entire inner surface of said clamp halves and the entire outer surface of said rectangular block.

5,009,051

CLIP CONSTRUCTION FOR ALIGNING SIDING SECTIONS

Ronald F. Trezza, P.O. Box 764, Melville, N.Y. 11747

Filed Oct. 20, 1989, Ser. No. 424,677
Int. Cl.[5] E04B 1/41; E04C 5/18
U.S. Cl. 52—410 **29 Claims**



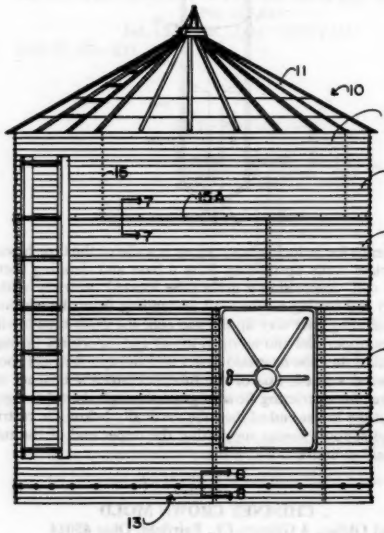
1. A wall construction comprising a wall, siding sections on said wall and in coplanar end-to-end relationship and including abutting ends with nesting tongue and groove means to resist relative transverse movement between said sections, said siding sections having inner and outer faces, said tongue defining a passage extending transversely thereacross, a clip including a central portion between said sections and extending through said passage in said tongue, said clip including first and second further portions extending in opposite directions from said central portion along opposite sides of respective of the siding sections, protruding means extending outwardly from the first further portion, a suitable material adjacent the siding sections and in which said protruding means is embedded, and holdback and alignment means extending from said central portion in opposite direction from said first further portion of the clip for holding one of the siding sections against the wall, said holdback and alignment means engaging the outer face of said one siding section.

5,009,052

METHOD AND APPARATUS FOR CONSTRUCTION OF GRAIN BINS

Herbert T. Welch, Calgary, Canada, assignor to John P. Welch, Alberta, Canada

Filed Aug. 15, 1989, Ser. No. 394,121
Int. Cl.[5] E04B 1/00
U.S. Cl. 52—742 **18 Claims**



1. A method of constructing grain bins comprising the steps of:

(a) securing together a plurality of base wall segments to form a circular base wall section on the ground, said base wall section having an out-turned horizontal annular flange around the upper edge thereof;

(b) engaging a centre pin with the ground and extending upwardly perpendicularly therefrom within the confines of said circular base wall section,

(c) engaging a plurality of said ground engaging pins perpendicularly through pin retaining and supporting brackets extending inwardly from said segments with the upper ends of said pins extending above said brackets but not penetrating the ground surface, said pins being situated substantially equidistantly around said base wall,

(d) extending a radius member between said centre pin and, successively, several of said pins extending perpendicularly through said brackets and then adjusting the position of said base wall section until it is substantially circular and the circumference is substantially equidistantly situated from said centre pin,

(e) engaging said pins in said brackets, with the ground to anchor said base wall section in position,

(f) horizontally levelling said out-turned flange of said base wall section by adjusting said base wall section vertically relative to each of said pins,

(g) securing said base wall section to said pins in said level,

(h) pouring gravel and then concrete into said base wall section and levelling the upper surface of the concrete by screeding same substantially level with said out-turned flange and,

(i) then erecting the grain bin upon said base wall.

5,009,053

STORAGE AND TRANSPORT TRAY AND TRAY PACKING SYSTEM

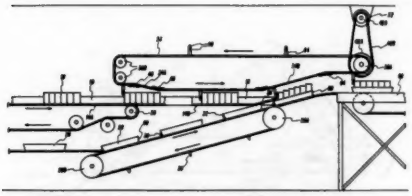
Keith A. Langenbeck, 4005 University Blvd., Dallas, Tex. 75205, and Jesse P. Kensinger, Richardson, Tex., assignors to Keith A. Langenbeck, Dallas, Tex.

PCT No. PCT/US88/00290, § 371 Date Sep. 26, 1989, § 102(e) Date Sep. 26, 1989, PCT Pub. No. WO88/07478, PCT Pub. Date Oct. 6, 1988

PCT Filed Jan. 29, 1988, Ser. No. 435,540

Int. Cl.[5] B65D *6/34, 8/06;* **B65B** *5/10, 39/00*

U.S. Cl. 53—58 **57 Claims**



29. A system for pac king containers into corresponding trays, comprising:

first conveyor means for transporting said containers along a first track;

means for dividing said containers into selected groups, the number of containers in each group corresponding to the number of containers to be packed into each tray;

second conveyor means for transporting said trays along a second track, a portion of said second track being inclined with respect to said first track so that the first and second tracks converge at a predetermined location; and

a support member disposed adjacent to said predetermined location for journally supporting said containers as said containers are being packed into the corresponding tray, said support member being reciprocally moveable along an upstream-downstream axis between a first position at which said support member is substantially fully extended for introducing a corresponding group of containers into the corresponding tray and a second position at which said support member is substantially fully retracted for allowing the trailing edge of the corresponding tray to clear said support member as said tray is moved along the inclined portion of the second track after all of the containers in the corresponding group have been packed into the tray.

5,009,054

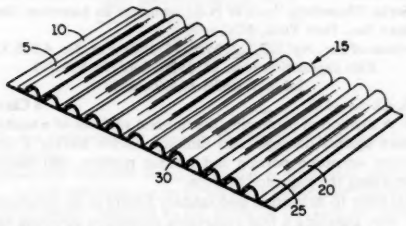
METHOD OF STORING THREAD IN AN EMBROIDERY THREAD-HOLDER

Roena B. Jons, Kerrville, Tex., assignor to Anthony E. Braun, Kerrville, Tex., a part interest

Filed Sep. 8, 1989, Ser. No. 405,149

Int. Cl.[5] B65B *27/06, 27/12, 67/00, 15/04*

U.S. Cl. 53—397 **3 Claims**



1. A method for storage and retrieval of thread for an embroidery thread-holder, which comprises:

placing an elongated tool at a distal end of a cylindrical compartment of said embroidery thread holder;

protruding a hook of said elongated tool through said cylindrical compartment and from a proximate end of said cylindrical compartment;

attaching a coiled bundle of thread to said hook at said proximate end of said cylindrical compartment; and

retracing said coiled bundle of thread to said hook at said proximate end of said cylindrical compartment such that semi-circular tips of said bundle of thread remain protruding from said proximate end and said distal end of said cylindrical compartment; cutting said semi-circular tips of said bundles of thread protruding from said proximate and distal ends of said cylindrical compartments to allow retrieval of said thread in lengths used for embroidery.

5,009,055

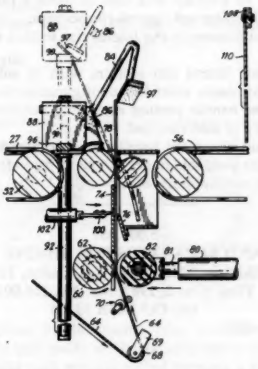
APPARATUS AND METHOD FOR WRAPPING BUNDLES OF NEWSPAPERS OR THE LIKE

Chris B. Simmons, 352 Meadow Rd., Kings Park, N.Y. 11754

Filed Apr. 11, 1990, Ser. No. 508,064

Int. Cl.[5] B65B *11/08*

U.S. Cl. 53—397 **27 Claims**



24. A method for wrapping at least three adjacent surface portions of a bundle of papers such as newspapers or the like prior to tying the bundle, which comprises:

(a) conveying the bundle in a predetermined direction toward tying means;

(b) dispensing wrapping material from a location below and in a direction generally transverse to the path of the bundle at a predetermined dispensing rate;

(c) gripping said material at an upper marginal position and guiding said wrapping material upwardly int to path of the bundle at substantially the same rate as said predetermined dispensing rate so as to permit the bundle to thereby become wrapped with said material over at least two adjacent surfaces; and

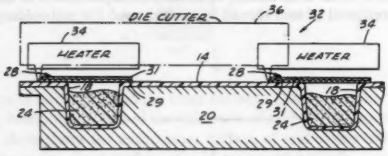
(d) controlling the speed of said wrapping material dispensing means and the conveying speed of the bundle so as to be comparable and respectively sequenced to permit predetermined surface portions of the bundle to become overwrapped with predetermined surface portions of overwrap material prior to tying the bundle.

5,009,056

METHOD FOR PREPARING FINGER MOUNTABLE DISPENSING CUPS

Don D. Porteous, 2794 Moraga Dr., Los Angeles, Calif. 90024

Continuation-in-part of Ser. No. 278,570, Dec. 1, 1988, abandoned, which is a continuation-in-part of Ser. No. 140,303, Dec. 31, 1987, Pat. No. 4,844,308, which is a continuation-in-part of Ser. No. 4,543, Jan. 16, 1987, Pat. No. 4,717,057. This application Dec. 27, 1989, Ser. No. 457,889
The portion of the term of this patent subsequent to Jul. 4, 2006, has been disclaimed.
Int. Cl.[5] B65B *47/02, 61/14, 61/18*
U.S. Cl. 53—412 8 Claims



1. A method for preparing a substantially fluid impervious, sealed, dental paste dispensing cup having an integrated finger mount, which comprises:

forming a portion of a substantially fluid impervious, yieldable, plastic sheet into a cup having an open end and a closed end;

adding dispensable, dental paste material to said cup through said open end;

placing a sealable closure over the open end of said cup and marginally beyond the periphery of said open end to provide an overlap area that includes a pre-determined, outwardly disposed, lateral rim section;

sealing said closure to the lateral rim section of said plastic sheet;

excising said lateral rim section, with its subtending cup, from said plastic sheet in a configuration that includes an elongated handle portion extending outwardly from the periphery of said rim; and

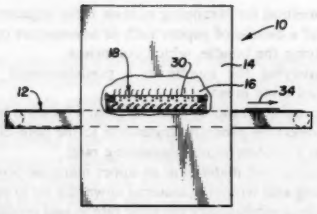
shaping said elongated handle portion into the form of an elastically yieldable finger mount to provide a slide-resistant grip on a support finger.

5,009,057

METHOD AND APPARATUS FOR SHRINK WRAPPING

Frank G. Wilkinson, 2276 Larson La., Dallas, Tex. 75229

Filed Nov. 2, 1987, Ser. No. 116,001
Int. Cl.[5] B65B *53/06*
U.S. Cl. 53—439 12 Claims



1. A shrink package system for shrink wrapping an article with shrink film, comprising in combination:

conveyer means for conveying the article covered by the shrink film;

means for blowing hot air on the shrink film while the article and shrink film are on the conveyer means;

a plurality of rollers; and

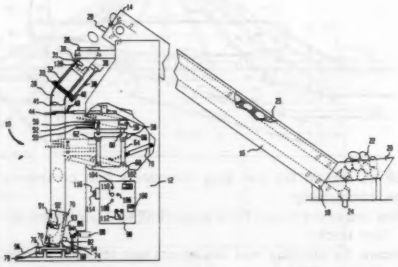
means for supporting the plurality of rollers above the conveyer means wherein the article travels beneath the plurality of rollers as it is conveyed and wherein the covered article is in contact with at least one of the rollers during a substantial portion of the time in which it is subjected to the means for blowing hot air.

5,009,058

AUTOMATIC BALING MACHINE

Lawrence Ptaschek, Roanoke; James Bowman, Salem, and H. William Ferguson, Jr., Buchanan, all of Va., assignors to NSW Corporation, Inc., Roanoke, Va.

Filed Jan. 29, 1990, Ser. No. 471,459
Int. Cl.[5] B65B *9/16, 39/06*
U.S. Cl. 53—469 36 Claims



24. A method for automatically baling a plurality of items into a bale formed from a tube of flexible material utilizing a device having conduit means for conducting said plurality of items from an inlet at one end of said conduit means to an outlet at the other end, said tube being coaxially mountable on an outer surface of said conduit means, dispenser control means having a locked and an unlocked position for selectively dispensing a length of said tube when in the unlocked position, and base means for holding said conduit means, comprises the steps of:

A. coaxially mounting said tube about the outer surface of said conduit means;

B. dispensing a selected length of said tube under the control of said dispenser control means such that a free end of said tube extends beyond said outlet end of said conduit means;

C. sealing said free end to form a sock-like item receptacle;

D. depositing a selected number of said items in said inlet;

E. capturing said items passing through said conduit means and out said outlet within said sock-like receptacle;

F. additionally sealing said tube at a position along the length of said tube proximate to said captured items and distal to said sealed free end to form said bale; and

G. cutting said tube immediately above said additional seal to free said bale from the remainder of said tube.

5,009,059

METHOD AND APPARATUS FOR PROTECTING THE FINISHED SURFACES OF SANITARY FIXTURES

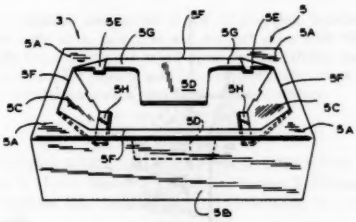
Michael J. Cocciadiferro, West New York, and Robert J. De Serio, Bloomfield, both of N.J., assignors to American Standard Inc., New York, N.Y.

Division of Ser. No. 329,722, Mar. 14, 1989, Pat. No. 4,970,733. This application Aug. 22, 1990, Ser. No. 570,747
Int. Cl.[5] B65B *11/00, 23/00*
U.S. Cl. 53—472 3 Claims

1. A method of protecting the finished surfaces of a sanitary fixture against damage, said sanitary fixture having a deck portion, an apron portion and a sump portion, said method comprising the sequence of steps:

(a) prior to delivering said sanitary fixture to an installation site, installing a first removable protective covering having planar deck and apron portions flexibly connected together over said deck portion and said apron portion of

said finished surfaces of said sanitary fixture, said planar deck portion having a sump-defining opening formed therein surrounded by said deck, installing a second removably protective covering having a plurality of planar sump surface-covering portions flexibly connected together through said sump-defining opening and over said sump portion of said finished surfaces, said first and second protective coverings having a geometry which generally conforms to the surface geometry of said finished surface of said sanitary fixture, and having a construction sufficient to provide cushioning against and absorb impact of objects coming into mediated contact with a portion of said finished surface; and



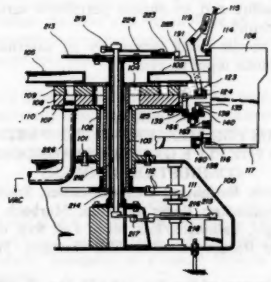
(b) delivering said sanitary fixture and said installed first and second protective coverings to an installation site at which said sanitary fixture is to be installed so that said sanitary fixture can be installed at said installation site with said installed first and second protective coverings protecting said finished surfaces of said sanitary fixture against damage sustainable during installation and construction at said installation site, and thereafter said first and second protective coverings can be removed from said sanitary fixture so as to provide said finished surfaces of said sanitary fixture undamaged after installation and construction at said installation site.

5,009,060

VACUUM PACKAGING APPARATUS

Takao Furukawa, Onomichi, Japan, assignor to ECS Corporation and Furukawa Mfg., Co., Ltd., both of, Japan

Filed Aug. 7, 1989, Ser. No. 390,416
Claims priority, application Japan, Mar. 31, 1989, 1-83096
Int. Cl.[5] B65B *31/02, 43/30*
U.S. Cl. 53—512 **13 Claims**



1. An apparatus for vacuum packaging objects into bags, comprising:

chambers rotatable along a circular endless track and into which said bags are to be supplied through an opening,

drive means disposed in the inside of the circular endless track,

a pair of support means disposed in each of said chambers and relatively movable toward and away from each other and which have opposed faces large enough to grasp therebetween a substantial part of one of the bags as the bag is supplied into the chamber,

means for mechanically engaging the support means to each other and relatively moving said support means toward and away from each other by means of the power delivered from the drive means,

a plurality of suction holes formed on said opposed faces of said pair of support means,

suction means for causing a vacuum force or suction to be applied through said suction holes in order to suck opposite sides of the bag when the support means are relatively moved toward each other and open the mouth of the bag when the support means sucking the bag are separated from each other,

means for loading the to-be-packaged object into the bag when the mouth thereof is opened,

means for closing said opening of said chamber when the bag is filled with said object,

means for vacuumizing the chamber when closed,

means for heat sealing the mouth of the bag under vacuum,

a bottom opening of the chamber and a bottom plate operable to open and close said bottom opening, and

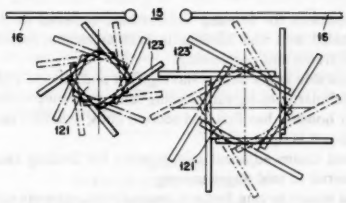
means for discharging a vacuum packaged product through the bottom opening from the chamber after the mouth of the bag has been heat sealed.

5,009,061

PROCESS AND APPARATUS FOR HARVESTING OF CROPS FROM STALKS AND CHOPPING THE STALKS

Ulrich S. Heuling, Tillmannstrasse 5, D-4410 Warendorf, Fed. Rep. of Germany

Filed Nov. 20, 1989, Ser. No. 438,042
Int. Cl.[5] A01D *45/02*
U.S. Cl. 56—104 **23 Claims**



1. In a process for harvesting crop clusters of tall plant stalks, wherein said stalks are introduced into a longitudinally extending intake path and are pulled through a gathering gap disposed in said intake path to strip said crop clusters from said stalks, the improvement comprising the steps of:

providing a pair of bladed rotary members having longitudinally extending axes disposed along opposing sides of said gathering gap,

rotating said members in opposite directions such that opposing blades of said members define a stalk contacting zone having an inlet situated proximate said gathering gap and an outlet situated remote from said gathering gap, said opposing blades having different tip speeds whereby stalks are fractured and severed by said opposing blades, said opposing blades radially overlapping during travel through said stalk contacting zone.

7. In a harvester attachment for gathering crop clusters of tall plant stalks including means defining a longitudinally extending stalk intake path in which stalks are received as said attachment is advanced, and means for pulling the stalks through a gathering gap disposed in said intake path to strip crop clusters from the stalks, the improvement comprising:

a pair of bladed rolls having longitudinally extending axes of rotation disposed along opposite sides of said gathering

gap, said rolls arranged such that opposing blades of said rolls define a stalk contacting zone having an inlet situated proximate said gathering gap and an outlet situated remote from said gathering gap, said opposing blades radially overlapping while traveling through said stalk contacting zone, and

drive means for rotating said rolls in opposite directions and such that opposing blades have different tip speeds whereby stalks are fractured and severed by said opposing blades.

5,009,062

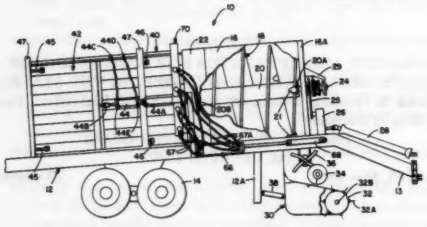
BALING APPARATUS

Oren D. Urich, Windsor, and Vernie G. Meyer, Fort Collins, both of Colo., assignors to Colorado National Manufacturers, Inc., Windsor, Colo.

Filed Feb. 7, 1989, Ser. No. 307,846

Int. Cl.[5] A01D *39/00*

U.S. Cl. 56—341 **18 Claims**



1. Apparatus for forming fibrous bulk material or the like into a baled unit and binding it, said apparatus including a wheeled frame and comprising:

(a) rotatable auger means having first and second ends;

(b) a tubular housing surrounding said auger means; wherein said housing has first and second ends; wherein said second end is open;

(c) feed means adjacent said housing for feeding said bulk material to said auger means;

(d) die means having first and second ends, wherein said first end communicates with said second end of said housing;

(e) a packing chamber communicating with said second end of said die means; wherein said chamber includes a top, a floor, and opposing side wall members; wherein said side wall members are adjustably movable inwardly and outwardly to adjust the packing tension on said bulk material in said chamber; and further comprising control means for moving said side wall members inwardly and outwardly in response to a predetermined tension value;

(f) binding means adjacent said packing chamber; wherein said auger means urges said bulk material through said housing and said die means and into said packing chamber; wherein said die means shapes said bulk material; wherein said binding means encircles said shaped bulk material with a flexible binding member and then secures said binding member so as to form said baled unit without cessation of rotation of said auger means; wherein said auger means is able to move axially with respect to said tubular housing, wherein said side wall members are connected to a hydraulic cylinder for movement inwardly and outwardly, wherein said control means comprises a switch operably connected to said hydraulic cylinder, and wherein said auger means activates said switch when said auger means moves axially.

5,009,063

ROTARY RING SPINNING DEVICE PROVIDED WITH A RING MOTOR

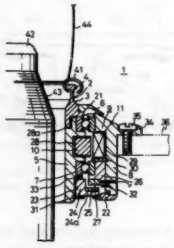
Hiroshi Yamaguchi, 9-7, Ooyamada 4-chome, Kuwana-shi, Mie, Japan, and Masashi Yamaguchi, 12-7, Shimizuoka 1-chome, Sumiyoshi-ku, Osaka-shi; Osaka, Japan, assignors to Hiroshi Yamaguchi, Japan; Niroshi Kimura, Japan and Masashi Yamaguchi, Japan

Filed Nov. 8, 1989, Ser. No. 433,342

Claims priority, application Japan, Nov. 8, 1988, 63-282854; Apr. 26, 1989, 1-107060

Int. Cl.[5] D01H *7/58*

U.S. Cl. 57—124 **10 Claims**



1. A rotary ring spinning device utilized for a ring and traveler spinning machine provided with a conventional ring rail lifting mechanism and spindle driving mechanism,

said rotary ring spinning device comprising,

a horizontal annular holder rigidly mounted on said ring rail,

a horizontal annular ring body rotatably mounted on said horizontal annular holder by way of a bearing,

a spindle arranged coaxially in an inside space of said horizontal annular rotary ring body, said spindle being driven by said driving mechanism,

an inner motor coaxially disposed between said rotary ring body and said holder with respect said spindle at a central position of a coaxial line of said rotary ring body and holder,

said inner motor comprising,

an annular rotor made of a permanent magnet material and rigidly and coaxially mounted on an outside peripheral surface of said rotary ring body at a central axial position thereof,

an annular armature rigidly and coaxially mounted on an inside peripheral surface of said holder at a central axial portion thereof, to provide a small annular space between said armature and an outside peripheral surface of said annular rotor,

said inner motor being driven by an external electrical power source input thereto.

5,009,064

APPARATUS FOR MEASURING THE PARTICULATE MATTER IN THE FLUE GAS OR EXHAUST GAS FROM A COMBUSTION PROCESS

Ferdinand Grob, Besigheim; Dieter Kienzler, Stuttgart; Ernst Linder, Muehlacker; Roger Potschin, Marbach, and Heinz Stutzenberger, Vaihingen/Enz, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 254,623, Oct. 7, 1988, Pat. No. 4,922,714. This application Oct. 20, 1989, Ser. No. 424,463

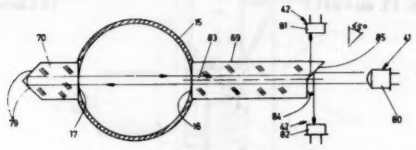
Claims priority, application Fed. Rep. of Germany, Nov. 23, 1987, 3739622; Nov. 22, 1988, 3839348

Int. Cl.[5] F01N *3/00*

U.S. Cl. 60—276 **21 Claims**

1. An apparatus for measuring a particulate matter in a flue gas or exhaust gas of a combustion process, having an optical transmitter containing a light source for emitting a beam of

light to be transmitted to an optical receiver embodied as a photodetector, said beam of light passes through two diametrically opposed light slits in a wall of a tail pipe (15), each slit being closed off by a transparent body embodied as a first glass rod (69) and a second glass rod (70), the light emitted crosses



a flow of exhaust gas carried in the exhaust pipe between the opposed light slits, said first and second glass rods (69, 70) including faces which are acted upon by the exhaust gas, and includes means for heating said faces of said transparent bodies to a temperature above a soot burn-off temperature.

5,009,065

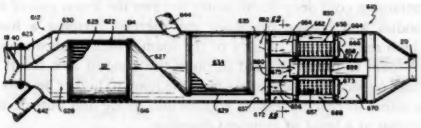
TUNED EXHAUST PROCESSOR ASSEMBLY

Michael G. Howe; James C. Arthur, and Robert T. Usleman, all of Columbus, Ind., assignors to Arvin Industries, Inc., Columbus, Ind.

Continuation-in-part of Ser. No. 319,069, Mar. 6, 1989, Pat. No. 4,961,314, which is a continuation-in-part of Ser. No. 232,023, Aug. 15, 1988, abandoned. This application Oct. 23, 1989, Ser. No. 425,308

Int. Cl.[5] F01N *3/02*

U.S. Cl. 60—288 **30 Claims**



1. An exhaust processor assembly comprising

a housing formed to include an inlet and an outlet,

partition means positioned within the housing for dividing an upstream portion of the housing into first and second flow passages,

a muffler situated in a downstream portion of the housing in close proximity to the outlet to attenuate noise generated by combustion product passing through one of the first and second flow passages toward the outlet,

a main filter substrate situated in the first flow passage to lie intermediate the inlet and the muffler and configured to collect particulate matter entrained in combustion product introduced into the first flow passage through the inlet, and

an auxiliary filter substrate situated in the second flow passage and configured to collect particulate matter entrained in the combustion product introduced into the second flow passage through the inlet.

5,009,066

AUTOMOTIVE POWER STEERING SYSTEM

David H. VanGorder, Saginaw, and Kenny R. Wilson, Fairgrove, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 13, 1989, Ser. No. 434,394

Int. Cl.[5] F16D *31/02*

U.S. Cl. 60—415 **4 Claims**

1. In an automotive power steering system including

a pump,

a servo-valve,

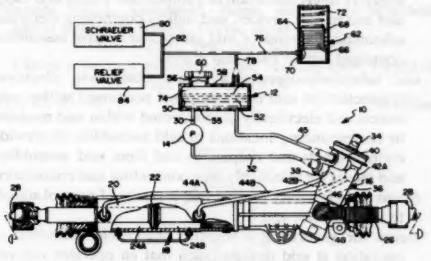
a steering assist fluid motor,

a reservoir having a reservoir chamber therein,

a plurality of fluid ducts interconnecting said reservoir and said pump and said servo-valve and said fluid motor, and

a volume of hydraulic oil in said power steering system establishing a fluid level in said reservoir chamber which varies between a minimum cold level when said working fluid is at a minimum operating temperature and a maximum hot level when said working fluid is at a maximum operating temperature and above which in said reservoir chamber is defined a gas chamber portion thereof, the improvement comprising:

means defining a fill port on said reservoir opening into said reservoir chamber at a location above said maximum hot level of said hydraulic oil,



a cover on said reservoir closing said fill port and defining a gas-tight seal between said reservoir and said cover to isolate said gas chamber portion from the atmosphere surrounding said reservoir,

means connected to said reservoir for introducing into said gas chamber portion a quantity of gas under pressure to establish an above-atmospheric pressure in variable volume gas chamber portion, and

a gas accumulator having an expansible chamber connected to said gas chamber portion,

said expansible chamber expanding in response to decreases in the volume of said gas chamber portion resulting from thermal expansion of said hydraulic oil to thereby minimize the increase in gas pressure in said gas chamber portion.

5,009,067

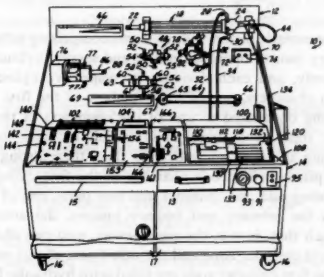
POWER TRANSMISSION

Raymond J. Bonnell, Waterford, Mich., assignor to Vickers, Incorporated, Troy, Mich.

Filed Oct. 6, 1988, Ser. No. 254,402

Int. Cl.[5] G09B *25/02*

U.S. Cl. 60—484 **33 Claims**



1. Apparatus for training an operator in use of electrohydraulic systems comprising:

a plurality of differing electrohydraulic devices responsive to electronic control signals for performing hydraulic

operations, each said device having associated operating characteristics which differ from those of other of said devices,

electronic control means including means for selectively generating a plurality of differing electronic control signals, a plurality of preassembled electronic control assemblies, means enclosing said assemblies to form separate control modules, and means on said enclosing means for selectively electrically interconnecting components of said assemblies within each said module and connecting said modules to said devices,

said enclosing means including an operator panel and fixed indicia on said operator panel coordinated with said assemblies for indicating options to an operator for said selective interconnection of components within said modules and to said devices, said indicia comprising electrical schematic diagrams of said electronic control assemblies contained within each said module,

said selectively-connecting means comprising electrical connectors on said operator panel positioned within said indicia and electrically preconnected within said modules to corresponding locations in said assemblies to provide control inputs and outputs to and from said assemblies, and means for selectively interconnecting said connectors,

means for selectively feeding said plurality of control signals to said devices, and

means for generating a visually observable indication of operation at said devices, such that an operator can observe effects of said differing electronic control signals on said devices.

5,009,068

PNEUMATIC CYLINDER WITH POSITIONING, BRAKING, AND FEED RATE CONTROL

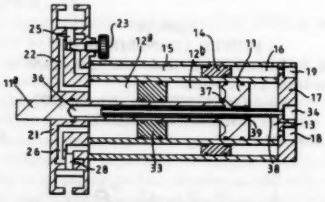
Douglas C. Clarke, 540 Marling Crescent, Paga hill, Great Britain

Filed Jun. 27, 1989, Ser. No. 372,054

Claims priority, application United Kingdom, Jun. 29, 1988, 8815449

Int. Cl.[5] F15B 7/00

U.S. Cl. 60—583 9 Claims



1. A pneumatic piston/cylinder unit comprising primary and secondary pistons operable in first and second cylinder zones respectively, and each dividing its respective cylinder zone into two chambers, one of the chambers of the first cylinder zone being connected to one of the chambers of the second cylinder zone by a passageway which includes means for controlling the flow of hydraulic fluid therethrough, and a tertiary piston in said one chamber of the first cylinder zone and dividing said one chamber into two parts, one of which is between the primary and tertiary pistons, the arrangement being such that, in use, the passageway, said one chamber of the second cylinder zone and the other part of said one chamber of the first cylinder zone are filled with hydraulic fluid, and the application of pneumatic pressure to the other chamber of the first cylinder zone causes the primary piston to be freely displaced until it abuts the tertiary piston whereupon movement of the primary piston may be arrested or controlled.

5,009,069

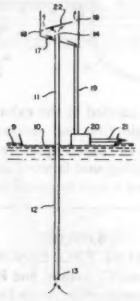
METHOD OF RECOVERING ENERGY FROM OCEAN WATER

Alberto E. Molini, P.O. Box 529, San German, P.R. 00753

Filed Aug. 24, 1990, Ser. No. 571,988

Int. Cl.[5] F03G 7/05

U.S. Cl. 60—641.1 14 Claims



1. A method of creating an upward flow of water from cold deep ocean water having a bulk density and a pressure and containing gases dissolved therein, comprising the steps of positioning in said ocean water a conduit having open upper and lower ends with its upper end above a surface of the ocean and its lower end at a location where the pressure is substantially greater than atmospheric pressure, and drawing sufficient water from the upper end of the conduit to cause the gas containing cold deep ocean water to enter the lower end of the conduit and release dissolved gas thereby forming a foam which reduces bulk density of the foam which in turn causes the foam to move upward through the conduit as a result of water outside the conduit pushing the foam to higher heights in an effort to reach pressure equilibrium inside and outside the conduit at a level of incipient foaming.

5,009,070

COMBUSTION APPARATUS FOR GAS TURBINE

Nobuyuki Iizuka; Fumiyuki Hirose, both of Hitachi; Naotatsu Asahi, Katsuta, and Yoshitaka Kojima, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 946,775, Dec. 29, 1986, abandoned, which is a continuation of Ser. No. 690,190, Jan. 10, 1985, abandoned. This application Apr. 9, 1987, Ser. No. 36,181

Claims priority, application Japan, Jan. 13, 1984, 59-3474

Int. Cl.[5] F02G 3/00

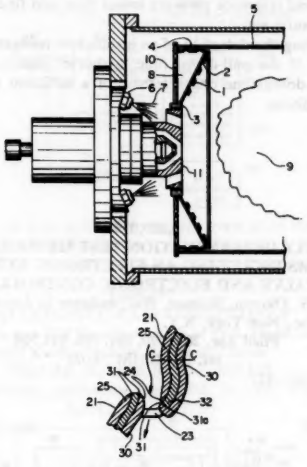
U.S. Cl. 60—753 5 Claims

1. A combustion apparatus comprising:

a liner cap means for closing an open end of a liner sleeve body of the combustion apparatus, the liner cap means including a first member having a plurality of cooling air holes therein and having formed on a first surface thereof, which is adapted to be subjected to flame radiation heat, a ceramic coating for thermally protecting said first member from flame radiation heat to which it is to be subjected, and having formed on a second surface thereof, opposite said first surface thereof, a corrosion resistant metal material, the heat conductivity of which is relatively high compared with said ceramic coating;

a fuel nozzle coupled with said liner cap means for supplying fuel through the combustion of which said liner cap means is subjected to flame radiation heat; and

wherein said liner cap means further comprises an outer sleeve surrounding said first member for defining an air



passage with said first member and an end plate of said liner cap means.

5,009,071

PROCESS FOR ADSORPTION COOLING/CONDITIONING BY MEANS OF LOW-TEMPERATURE HEAT

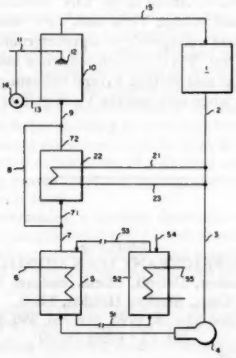
Norbert Schwetje, Hanover; Rudolf Sizmann, and Noureddine Khelifa, both of Munich, all of Fed. Rep. of Germany, assignors to Kali-Chemie AG, Hanover, Fed. Rep. of Germany

Filed Oct. 13, 1989, Ser. No. 421,051

Claims priority, application Fed. Rep. of Germany, Oct. 21, 1988, 3835872

Int. Cl.[5] F25D *5/00*

U.S. Cl. 62—4 **10 Claims**



1. A process for adsorption cooling conditioning of rooms by adsorption/desorption of water by a working medium comprising a liquid hygroscopic salt solution, said process comprising the steps of

(a) producing a dry air stream by adsorption of water from a water-containing air stream into an initial working medium to produce a water-enriched working medium,

(b) conditioning via evaporative cooling with water absorption by said dry air stream, and

(c) regenerating the water-enriched working medium by desorption of water using low-temperature heat and ambient air;

wherein said initial working medium is a salt solution comprising:

40 to 43% by weight of calcium chloride,

15 to 25% by weight of calcium nitrate,

0.5 to 5% by weight of an organic polyhydroxy compound, and

water to make 100% by weight.

5,009,072

REFRIGERATOR

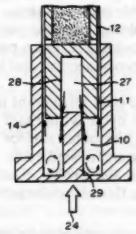
Masashi Nagao, Amagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 31, 1990, Ser. No. 472,849

Claims priority, application Japan, May 26, 1989, 1-133224

Int. Cl.[5] F25B *9/00*

U.S. Cl. 62—6 **10 Claims**



1. A refrigerator which comprises:

a cold accumulator,

an expansion chamber which includes a convex portion and a recessed portion which surrounds said convex portion,

a movable member which is provided in the expansion chamber, and which can move to change the inside volume of the expansion chamber,

a compressed operating gas which is introduced into the expansion chamber through the cold accumulator, the gas being expanded under the action of the movable member to generate cold, and being exhausted from the expansion chamber through the cold accumulator,

a recessed auxiliary expansion chamber which communicates with the expansion chamber through a narrow flow passage formed between said recessed portion of auxiliary expansion chamber and said convex portion of said recessed expansion chamber, and

an auxiliary movable member which is associated with the movable member, and which can be provided in the auxiliary expansion chamber to change the inside volume of the auxiliary expansion chamber.

5,009,073

FAST CYCLE CRYOGENIC FLEX PROBE

Dale J. Missimer, San Anselmo; David T. Fyfe, Jr., Novato; Joseph J. Housman, Sebastapol, and Scott M. Forrest, Half Moon Bay, all of Calif., assignors to Marin Tek, Inc., San Rafael, Calif.

Filed May 1, 1990, Ser. No. 517,325

Int. Cl.[5] F25B *19/00*

U.S. Cl. 62—51.1 **14 Claims**

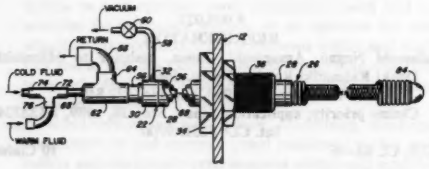
1. An elongated fast cycle cryopump probe device for use within a vacuum chamber having a wall section with a pass-through opening, said device comprising:

a rigid head end section adapted to be mounted on said wall section of said vacuum chamber while extending within a

pass-through, said head end section having a feed tube and a return flow passage;

valve means connected to said feed tube means for selectively receiving either a relatively cold refrigerant or a relatively hot refrigerant during different phases of operation;

a flexible probe section connected to said rigid head end section which is capable of being shaped in different ways to assume a preselected or variable configuration within the vacuum chamber workspace, said probe section including a flexible feed tube connected to said feed tube means of said head end section for carrying said refrigerants passing through said head section outwardly to the end of said flexible probe section;



a flexible outer tubular member surrounding said flexible feed tube for providing a return passage for said refrigerants along said probe section and through said head section;

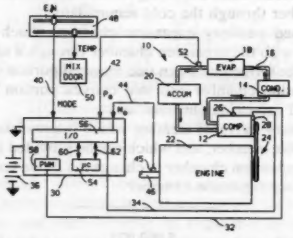
whereby when said cold refrigerant is flowing in said probe during a vacuum cycle within said chamber, water vapor is condensed on the outer surface of said flexible probe section and at the end of said cycle when said hot refrigerant is flowing in the probe, condensed water vapor is released from the flexible probe section to the surrounding atmosphere.

5,009,074

LOW REFRIGERANT CHARGE PROTECTION METHOD FOR A VARIABLE DISPLACEMENT COMPRESSOR

Ronald J. Goubeaux, Lockport, and Edward D. Pettitt, Burt, both of N.Y., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 2, 1990, Ser. No. 562,100
Int. Cl.[5] F25B *49/02*
U.S. Cl. 62—115 **6 Claims**



1. In a vehicle air conditioning system including a refrigerant compressor, the displacement of which is controlled to maintain a measured refrigerant vapor pressure at a desired value, a control method for protecting said compressor from damage due to continued operation with insufficient refrigerant charge, comprising the steps of:

controlling the compressor to a minimum displacement once the vapor pressure of the refrigerant reaches the desired value, to thereby initiate a set-up period in which the measured vapor pressure is permitted to increase;

controlling the compressor to a maximum displacement once the measured vapor pressure reaches a first reference pressure, thereby to terminate said set-up period and define a pull-down period in which the measured vapor pressure is decreased by the compressor at a maximum rate;

measuring a pull-down time required for the measured vapor pressure to decrease from the first reference pressure to a second reference pressure lower than said first reference pressure; and

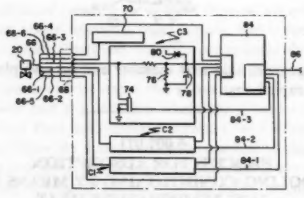
indicating the detection of an insufficient refrigerant condition if the pull-down time is shorter than a reference pull-down time characteristic of a sufficient refrigerant condition.

5,009,075

FAULT DETERMINATION TEST METHOD FOR SYSTEMS INCLUDING AN ELECTRONIC EXPANSION VALVE AND ELECTRONIC CONTROLLER

Ronald W. Okoren, Holmen, Wis., assignor to American Standard Inc., New York, N.Y.

Filed Apr. 20, 1990, Ser. No. 511,706
Int. Cl.[5] G01M *19/00*
U.S. Cl. 62—127 **9 Claims**



1. A method of testing in a refrigeration system an electronic, stepper motor driven expansion valve with an end-of-stroke indication and an electronic controller including a stepper motor drive circuit, said method comprised of:

setting said drive circuit to an "OFF" condition;

measuring a voltage V_C in said "OFF" condition;

comparing said voltage V_C to a predetermined voltage V_B;

indicating a test "FAIL" condition when said voltage V_C is less than said voltage V_B; and alternatively

setting said drive circuit to an "ON" condition;

measuring said voltage V_C in said "ON" condition;

comparing said voltage V_C to a predetermined voltage V_O;

indicating a test "FAIL" condition when said voltage V_C is greater than said voltage V_O and indicating a test "PASS" condition when said voltage V_C is greater than said voltage V_O.

5,009,076

REFRIGERANT LOSS MONITOR

James G. Winslow, Detroit, Mich., assignor to Temperature Engineering Corp., Sterling Heights, Mich.

Filed Mar. 8, 1990, Ser. No. 490,367
Int. Cl.[5] F25B *49/00*
U.S. Cl. 62—129 **2 Claims**

1. A method of monitoring the refrigerant within a refrigerant circuit, including the steps of:

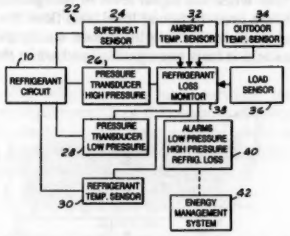
(b 1) sensing an environmental condition;

(b 2) cyclically sensing a refrigerant condition;

(b 3) utilizing at least the sensed environmental condition to determine an expected refrigerant condition; and

(b 4) comparing the expected refrigerant condition to the

actual refrigerant condition and actuating an alarm should the two differ by more than a preset amount and wherein



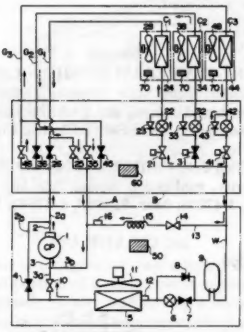
steps 1-14 4 are cyclically repeated even when the refrigerant circuit is shut down.

5,009,077

MULTI-SYSTEM AIR CONDITIONER

Seiji Okoshi, and Eiji Kuwahara, both of Fuji, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 26, 1990, Ser. No. 558,152
Claims priority, application Japan, Jul. 28, 1989, 1-195684
Int. Cl.[5] F25B *13/00*
U.S. Cl. 62—160 **9 Claims**



1. A multi-system air conditioner comprising:

an outdoor unit including a compressor for sucking, compressing and delivering a refrigerant and an outdoor heat exchanger for making an exchange between heat in an incoming refrigerant and heat in outdoor air;

a plurality of indoor units including an indoor heat exchanger, each, for allowing an exchange between the heat in the incoming refrigerant and the heat in the indoor air and requesting at least one of a cooling operation mode and cooling power level and heating operation mode and heating power level;

means for determining a cooling operation mode when a total of a cooling power level or levels requested from one or more indoor units is greater than a total of a heating power level or levels requested from one or more remaining indoor units;

means for enabling a refrigerant which is delivered from the compressor to pass through the outdoor heat exchanger, when a cooling operation mode is determined, and to be returned back to the compressor via one or more indoor units calling for a cooling operation mode;

means for enabling one stream of the refrigerant which is delivered from the compressor to pass through one or more indoor units calling for a heating operation mode and to meet a refrigerant flowing into one or more outdoor units calling for a cooling operation mode;

means for determining a heating operation mode when a total of a heating power level or levels requested from one or more indoor units is greater then a cooling power level or levels requested from one or more remaining indoor units;

means for enabling the refrigerant which is delivered from the compressor to pass through one or more indoor units calling for a heating operation mode, when the heating operation mode is determined, and to be returned back to the compressor via the outdoor heat exchanger;

means for enabling one stream of a refrigerant which passes through one or more indoor units calling for a heating operation mode to circulate through one or more indoor units calling for a cooling operation mode, when a heating operation mode is determined, and to be returned back to the compressor;

first detecting means for detecting a temperature in the outdoor heat exchanger;

means for determining a stop mode of the outdoor heat exchanger when a difference between a total of a heating power level or levels requested from one or more indoor units and that of a cooling power level or levels requested from one or more remaining indoor units falls within a predetermined range;

means for enabling a refrigerant which is delivered from the compressor to pass through one or more indoor units calling for a heating operation mode, when the stop mode of the outdoor heat exchanger is determind, and to be returned back to the compressor via one or more indoor units calling for a cooling operation mode;

second detecting means for detecting a saturation temperature prevalent in the refrigerant flowing through the indoor unit, when the stop mode of the outdoor heat exchanger is determined; and

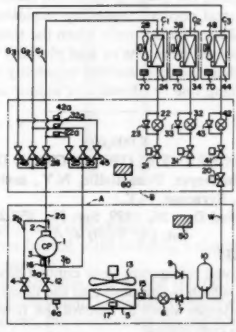
recovering means which, when the stop mode of the outdoor heat exchanger is determined, enables a refrigerant which is accumulated on the outdoor heat exchanger to be recovered back to the compressor if a result of detection by the second detecting means is higher than a result of detection by the first detecting means.

5,009,078

MULTI-SYSTEM AIR CONDITIONING MACHINE

Seizi Ohkoshi, and Eiji Kuwahara, both of Fuji, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 23, 1990, Ser. No. 483,654
Claims priority, application Japan, Feb. 27, 1989, 1-45738
Int. Cl.[5] F25B *13/00*
U.S. Cl. 62—160 **11 Claims**



1. A multi-system air conditioning machine comprising:

an outdoor unit including a compressor for drawing, compressing, and delivering a refrigerant, and an outdoor heat

exchanger for exchanging heat of the supplied refrigerant and heat of outer air;

a plurality of indoor units each including an indoor heat exchanger for exchanging the heat of the supplied refrigerant and heat of inner air, for requiring a cooling operation mode and a cooling capability or a heating operation mode and a heating capability;

means for supplying the refrigerant delivered from said compressor to said outdoor heat exchanger, supplying the refrigerant to one or said plurality of indoor units which request a cooling operation mode, and returning the refrigerant to said compressor when a total cooling capability requested from one or said plurality of indoor units is larger than a total heating capability requested from the remaining one or plurality of indoor units;

means for supplying a part of the refrigerant delivered from said compressor to one or said plurality of indoor units which request a heating operation mode to cause the part of refrigerant to join the flow of the refrigerant to one or said plurality of indoor units which request a cooling operation mode, when a total cooling capability requested from one or said plurality of indoor units is larger than a total heating capability requested from the remaining one or plurality of indoor units;

setting means for setting an amount of refrigerant supplied to said outdoor heat exchanger to be relative to an amount of refrigerant supplied to one or said plurality of indoor units which request the heating operation mode in accordance with the total heating capability requested from one or said plurality of indoor units when the total cooling capability requested from one or said plurality of indoor units is larger than the total heating capability requested from the remaining one or plurality of indoor units;

means for supplying the refrigerant delivered from said compressor to one or said plurality of indoor units which request a heating operation mode, supplying the refrigerant to said outdoor heat exchanger, and returning the refrigerant to said compressor, when a total heating capability requested from one or said plurality of indoor units is larger than a total cooling capability requested from the remaining one or plurality of indoor units;

means for supplying a part of the refrigerant supplied from one or said plurality of indoor units which request a heating operation mode to one or said plurality of indoor units which request a cooling operation mode, and returning the refrigerant to said compressor, when a total heating capability requested from one or said plurality of indoor units is larger than a total cooling capability requested from the remaining one or plurality of indoor units; and

setting means for setting an amount of refrigerant supplied to said outdoor heat exchanger to be relative to an amount of refrigerant supplied to one or said plurality of indoor units which request the cooling operation mode in accordance with the total cooling capability requested from one or said plurality of indoor units when the total heating capability requested from one or said plurality of indoor units is larger than the total cooling capability requested from the remaining one or plurality of indoor units.

5,009,079

REFRIGERANT FLOW CONTROL DEVICE

Thomas M. Zinsmeyer, Pennellville, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Dec. 26, 1989, Ser. No. 457,228

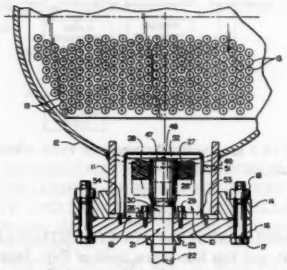
Int. Cl.[5] F25B *41/04*

U.S. Cl. 62—218 **13 Claims**

1. An improved refrigerant flow control device of the type having a float which is responsive to the liquid level of refrigerant in a condenser sump to control the flow of refrigerant from the sump comprising:

a standpipe extending upwardly from a lower portion of the sump, said standpipe having its upper end closed and having near its lower end at least one opening formed to provide fluid communication from the lower portion of the sump to a refrigerant return line below; and

a float device slideably disposed on said standpipe in such a way that when the liquid level of refrigerant in the sump is below a predetermined level, said float device is caused to rest at a vertical height on said standpipe such that it covers said at least one opening, and when the liquid level



of refrigerant rises above said predetermined level, said float device is caused to slide upwardly to uncover said at least one opening and allow liquid refrigerant to flow from the sump; wherein said float device has an undercut portion surrounding said standpipe such that the amount of surface contact between said float device and said standpipe is reduced.

5,009,080

LOW-TEMPERATURE SHOW CASE

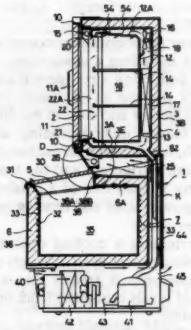
Hiroshi Naganuma; Kenji Sato; Masashi Yamamoto; Toshiaki Kubota; Hiroshige Hayashi, and Yoshirou Ishizaka, all of of Gunma, Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Feb. 13, 1990, Ser. No. 479,390

Claims priority, application Japan, Feb. 16, 1989, 1-36551; Feb. 27, 1989, 1-47958; Mar. 9, 1989, 1-57341; Mar. 28, 1989, 1-76928

Int. Cl.[5] A47F *3/04*

U.S. Cl. 62—256 **10 Claims**



7. A low-temperature show case comprising:

a thermally insulated box having an opening on one side of the box;

a partition board lined along the inner surface of said thermally insulated box;

a first cold-air passage formed between said thermally insulated box and said partition board, and having

an outlet and an inlet of said first air passage, said outlet and inlet facing with each other at opposite ends of said opening, respectively, and

a refrigeration apparatus and a blower for circulating cold air in said first passage;

a goods-storing room surrounded by said partition board;

a cold-air curtain being formed across said opening when said refrigeration apparatus and blower operate, wherein the width of said outlet is greater than that of said opening; and

angular walls, which are at least partially transparent, formed on the front ends of the opposite side-walls of said thermally insulated box, said angular walls narrowing towards the opening and being in contact with opposite edges of the air curtain.

5,009,081

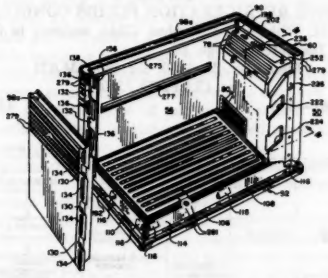
MODULAR MECHANICAL REFRIGERATION UNIT

Richard W. Kruck, Sodus Township, Berrien County; Omer N. Cur; Douglas D. Leclear, both of St. Joseph Township, Berrien County; Steven J. Kuehl, Royalton Township, Berrien County, all of Mich., and Ralph R. Burin, Milton Township, DuPage County, Ill., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Division of Ser. No. 218,233, Jul. 12, 1988, Pat. No. 4,907,419. This application Mar. 12, 1990, Ser. No. 489,441

Int. Cl.[5] T25D *23/06*

U.S. Cl. 62—264 **3 Claims**



1. A mechanical refrigeration unit adapted to form a relatively thin wall portion of a refrigeration apparatus, comprising a molded plastic divider wall having a layer of insulating material on one side thereof, an evaporator mounted on said one side of said divider wall, a condenser mounted on the other side of said divider wall, first fan means mounted on said divider wall for moving air over said evaporator and into the space to be cooled, second fan means mounted on said divider wall for moving air from the exterior over said condenser, a light source mounted on said divider wall, means for energizing said light source during periods when said mechanical refrigeration unit is energized and means for directing light from said source through an opening in a wall of said refrigeration apparatus, thereby to provide a visual indication of said power-on periods.

5,009,082

SYSTEM FOR COOLING BEER FOR REMOTE DISPENSING

Martin J. Abraham, III, 857 Timber Bend St., Lacombe, La. 70445

Filed Jul. 3, 1989, Ser. No. 379,480

Int. Cl.[5] B67D *5/62*

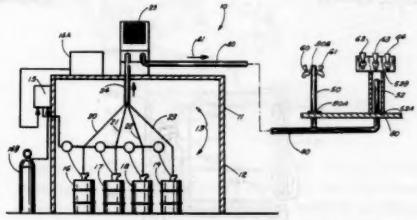
U.S. Cl. 62—390 **4 Claims**

1. A system for cooling beer to be dispensed from a container comprising:

(a) a cooled housing with an interior having a preliminarily air-cooled housing with an interior having a preliminarily air-cooled environment that is cooled to a first temperature below ambient temperature with a primary heat exchanger; p1 (b) a first flowline for dispensing beer from the container;

(c) an auxiliary heat exchanger having a glycol reservoir for receiving the first flowline, and the first flowline including multiple stacked coils of the first flowline within the reservoir in heat exchange relation therewith;

(d) a second flowline comprising at least a pair of internal bores including a first bore in fluid communication with the first flowline downstream of the glycol reservoir and a second bore carrying glycol from the reservoir in close



proximity and in heat exchange relation with beer in the first bore, the second flowline being extended in length so that beer and glycol can travel to remote positions away from the container;

(e) a spigot for dispensing beer at the remote position that has been transmitted thereto via the second flowline;

(f) means for returning the glycol to the reservoir; and

(g) the first flowline having one or more fittings forming connections between the container and the reservoir that produce substantially laminar flow between the container and the reservoir.

5,009,083

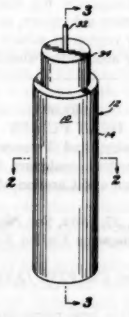
BEVERAGE COOLER

Frank T. Spinos, 3455 Lebon, #1631, San Diego, Calif. 92122, and Sharon M. Worley, 3549 Castle Glen Dr., #226, San Diego, Calif. 92123

Filed Dec. 6, 1989, Ser. No. 447,227

Int. Cl.[5] B67D *5/62*

U.S. Cl. 62—400 **8 Claims**



1. A beverage cooler comprising:

a first container having walls defining a chamber for receiving a beverage;

a second container disposed within the first container and having walls defining a tubular passageway having an open lower end, the walls of the second container further defining an interior compartment surrounding the passageway for receiving a heat transfer medium to effect heat transfer between the heat transfer medium and beverage passing through the tubular passageway; and

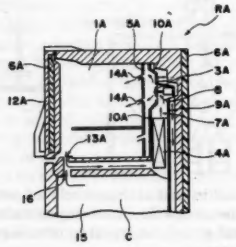
means fixing the second container against movement relative to the first container.

5,009,084

REFRIGERATOR

Syozo Tanaka, Nara; Akiro Takushima, Yamatotakada; Yoshiharu Shinobu, Kashiwara, and Masaki Eguchi, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Apr. 10, 1990, Ser. No. 506,785
Claims priority, application Japan, Apr. 13, 1989, 1-44152
Int. Cl.[5] F25D *11/02*
U.S. Cl. 62—441 6 Claims



1. A refrigerator comprising a cooling chamber including a refrigerating chamber and a freezing chamber, a send-out means for circulating air within said cooling chamber including an axial flow fan fixed on a fan fixing plate provided at an inner rear side of said freezing chamber, a heat exchanger for cooling the air circulated by said send-out means, a suction side space so formed as to guide the air cooled by the heat exchanger from said heat exchanger to the send-out means, said suction side space being defined between said fan fixing plate and an inner wall surface of a rear panel within the refrigerator, a sound absorbing material for absorbing noises produced in said suction side space and said cooling chamber so as to substantially preclude transmission of noise to the outside of the refrigerator, said suction side space and said cooling chamber respectively having resonance dimensions for resonation at specific frequency regions, and a partition plate in said suction side space and extending from said fan fixing plate to said inner wall surface of said rear panel for reducing noises produced in said suction side space, said partition plate being located to alter the resonance frequency for said suction side space thereby to set said suction side space, in its resonance dimension, to the frequency region at which the sound absorbing material can efficiently absorb the sound.

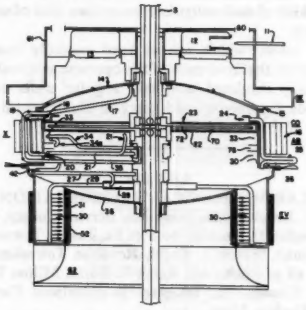
5,009,085

HEAT PUMPS

Colin Ramshaw, Kingsley, and Terence Winnington, Stroud, both of United Kingdom, assignors to Imperial Chemical Industries plc, London and Caradon Mira Ltd., Cheltenham, both of, England

Filed Jan. 27, 1989, Ser. No. 302,348
Claims priority, application United Kingdom, Feb. 2, 1988, 8802152
Int. Cl.[5] F25B *15/00*
U.S. Cl. 62—476 30 Claims

1. An absorption-cycle heat pump comprising a rotary assembly including a vapor generator, a condenser, an evaporator and an absorber so interconnected as to provide cyclic fluid flow paths for a volatile fluid component and an absorbent liquid therefor, a reservoir being provided for receiving from the condenser volatile fluid component condensed thereby in use, and means being provided for directing said component from the reservoir to heat exchange surface means of the evaporator so that said volatile component flows across the heat exchange surface means in a generally radially outward direction, the reservoir receiving from the heat exchange surface means of the evaporator such volatile component as remains unvaporize after flowing radially outward across said heat exchange surface means whereby part of the volatile compo-



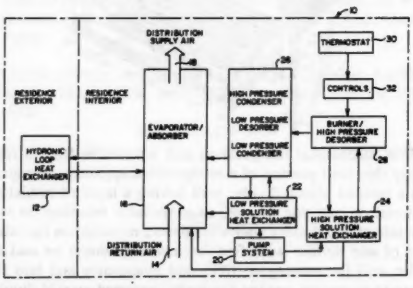
nent fed to said heat exchange surface means from the reservoir is recirculated back to the reservoir by-passing the condenser.

5,009,086

PASSIVE REFRIGERATION FLUIDS CONDITION

William H. Wilkinson, Columbus, Ohio, assignor to Gas Research Institute, Chicago, Ill.

Filed Mar. 30, 1989, Ser. No. 334,671
Int. Cl.[5] F25D *15/00*
U.S. Cl. 62—476 18 Claims



1. In a double-effect absorption refrigeration system (10), in combination, apparatus comprising:

(a.) a vertically-elongated, generally cylindrical, high-pressure condenser chamber means (38) receiving high-pressure refrigerant vapor from a high-pressure desorber chamber means (42) for condensing into high-pressure liquid refrigerant;

(b.) a vertically-elongated, generally cylindrical, low-pressure desorber chamber means (36) concentrically substantially enveloping said high-pressure condenser chamber means (38) in heat transfer relation and receiving relatively dilute refrigerant solution at its upper region for flowing over a chamber means heat transfer surface in heat-receiving relation to said high-pressure condenser chamber means (38) and conversion into high-pressure refrigerant vapor and high-pressure concentrated refrigerant solution; and

(c.) a vertically-elongated, generally cylindrical, low-pressure condenser chamber means (34) concentrically substantially enveloping said low-pressure desorber chamber means (36) in heat transfer relation and receiving low-pressure refrigerant vapor from said low-pressure desorber chamber means (36) for condensing into low-pres-

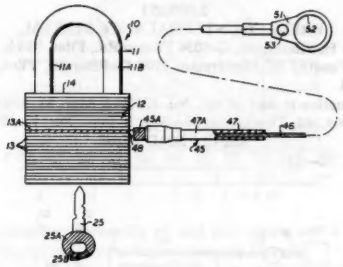
sure liquid refrigerant in a system cooling made of operation.

5,009,087

LOCK DEVICE WITH RETAINING CABLE

Royal B. Long, P.O. Box 66, Houston, Tex. 77001

Filed Aug. 20, 1990, Ser. No. 569,841
Int. Cl.[5] E05B 67/06
U.S. Cl. 70—49 19 Claims



1. A lock device comprising:
a lock case having side walls and top and bottom walls and apertured to receive the heel-piece and toe-piece of a shackle and one end of a retaining cable,
a shackle having a heel-piece at one end reciprocally and rotatably retained within one of said case apertures and a toe-piece at another end reciprocally received and retained in another one of said case apertures and being movable between locked and unlocked positions and a release position,
locking means within said lock case for engagement with said shackle to selectively lock said shackle heel-piece and toe-piece within said case,
a retaining cable having one end removably received in another said case aperture and engaged with said shackle to selectively lock said one end within said case and having another end adapted to be secured to objects for maintaining the lock device at a selected location,
said retaining cable one end being locked within said case with said shackle in its locked and unlocked position and selectively disengaged from said shackle and removed from said case upon manipulation of said shackle to its release position.

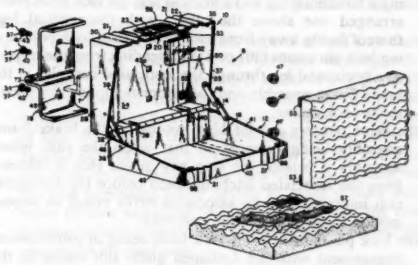
5,009,088

MODULAR LOCKBOX AND CARRYING CASE FOR PISTOLS

Daniel M. Cislo, 3413 Rambla Pacifico, Malibu, Calif. 90265

Continuation-in-part of Ser. No. 253,581, Oct. 5, 1988, Pat. No. 4,890,466, which is a continuation-in-part of Ser. No. 19,518, Feb. 26, 1987, Pat. No. 4,788,838. This application Dec. 4, 1989, Ser. No. 446,330
The portion of the term of this patent subsequent to Jan. 2, 2007, has been disclaimed.
Int. Cl.[5] E05B 65/52
U.S. Cl. 70—63 22 Claims

1. A handgun lockbox to prohibit unauthorized access to a handgun and lock the lockbox to a stationary object, the lockbox comprising:
(a) a coupling means;
(b) a pair of housings coupled together by said coupling means to form a chamber therebetween of sufficient size to hold the handgun and which can be secured together to prevent the unauthorized access to the handgun;
(c) a latch means for latching adjacent sides of said housings to lock the housings in alignment preventing unauthorized access to the chamber therebetween;
(d) a clip means for clipping one of said housings to the stationary object, wherein the clip means is of a length and geometric shape to engage the stationary object and



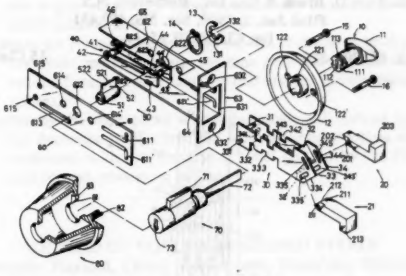
wherein said clip means fixedly attaches to one of said housings to hold the stationary object by said clip means to said one of said housings when in an installed condition.

5,009,089

DOUBLE HOOK-BOLT UNIT LOCK

Emily M. Y. Lin, No. 112, Sze Chuan Rd., Sec. 1, Panchiao City, Taipei Hsien, Taiwan

Filed Oct. 31, 1989, Ser. No. 429,620
Int. Cl.[5] E05B 63/14
U.S. Cl. 70—114 4 Claims



1. A double hook-bolt unit lock, including:
a lock casing (60) having an upper L-shaped guideslot means (611) and a lower L-shaped guide slot means (611'), each guide slot means having horizontal slot portions and vertical slot portions;
a rotary cam wheel assembly (50) located within said lock casing for rotational movement around a horizontal axis, said wheel assembly comprising a swingable arm (52);
a stop frame assembly (40) that includes a vertically movable wall mechanism having a curved cam surface (44) slidably and camingly engaged with said swingable arm, whereby swinging motion of said arm around the aforementioned horizontal axis causes said wall mechanism to reciprocate vertically, said wall mechanism including a stop key means (43) located below said curved cam surface;
a brake frame assembly (30) slidably mounted within said lock casing for rectilinear horizontal motion at right angles to the cam wheel assembly rotational axis; said brake frame assembly comprising a vertically oriented plate means (33) having an upper cam slot (335) and a lower cam slot (335'), said cam slots being acutely angled to the horizontal midplane of the plate means in an arrow configuration; said brake frame assembly having two drive notches (332 and 342) registering with said swingable arm,

and three latching notches (at 333) in registry with said stop key means;

two L-shaped lock bolts (20, 21) slidably mounted within the lock casing for movement between retracted positions located entirely within the lock casing and extended positions projecting from the lock casing; each lock bolt having a horizontal leg and a vertical leg, the lock bolts being arranged one above the other, with the vertical legs thereof facing away from each other; each lock bolt having lock pin means (201 or 211) extending from the respective horizontal leg through the associated cam slot in the brake frame assembly and the associated guide slot means in the lock casing;

the drive notches and latching notches in the brake frame assembly being oriented so that when the cam wheel assembly is rotated the stop key means (43) is released from the associated latching notch before the swingable arm interacts with an associated drive notch to import motion to the brake frame assembly;

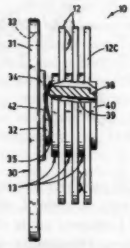
the lock pin means on the lock bolts being in simultaneous engagement with the L-shaped guide slot means in the lock casing and the angled slots in the brake frame, so that when the brake frame assembly is moved to a point where said lock pin means reached the vertical slot portions of the L-shaped guide slots, further motion of the brake frame assembly enables the angled slots to guide said lock pin means into and along the vertical slot portions, whereby the lock bolts are moved vertically away from each other.

5,009,090

COMBINATION LOCK ASSEMBLY

Patrick J. Beattie, West Henrietta; Andrew L. Oliveri, and Richard J. Sylvester, both of Rochester, all of N.Y., assignors to John D. Brush & Co., Inc., Rochester, N.Y.

Filed Jan. 2, 1990, Ser. No. 459,451
Int. Cl.[5] E05B *15/14*
U.S. Cl. 70—326 **15 Claims**



1. A combination lock assembly for installation in a safe or strong box, comprising:

an integrated resin structure with a mounting plate portion for receiving fasteners for installing the assembly and a bushing portion having a cylindrical bearing surface with an axial keyway and a step at its outer end;

a plurality of tumbler wheels, including a drive tumbler wheel, separated by a spacing washer between each, said drive tumbler wheel having a plurality of angularly spaced holes and all of said tumbler wheels and washers being supported on the bearing surface of said bushing portion;

a retaining cap fixed to the stepped end of said bushing portion;

a spring for biasing said tumbler wheels and washers away from said mounting plate portion so that said drive tumbler wheel is pressed against said retaining cap;

a lock spindle passageway through said mounting plate and bushing portions of said integrated structure;

a drive cam having a projecting drive stud; and

a rotatable spindle positioned in said passageway and fixed to said drive cam so that said drive stud is received into one of the angularly spaced holes in said drive tumbler wheel;

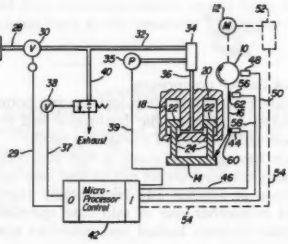
the bias of said spring being predetermined to allow said tumbler wheels and washers to be moved together as a unit away from said retaining cap and back toward said mounting plate so that the surfaces of said tumbler wheels and washers remain substantially parallel relative to each other when so moved.

5,009,091

PRESS COUNTERBALANCE SYSTEM

William H. Hinterman, G-5034 Fenton Rd., Flint, Mich. 48057, and Timothy W. Hinterman, 2104 Cadillac St., Flint, Mich. 48504

Continuation-in-part of Ser. No. 331,242, Mar. 31, 1989, Pat. No. 4,969,344. This application Sep. 5, 1990, Ser. No. 577,886
Int. Cl.[5] B21D *24/02*
U.S. Cl. 72—21 **7 Claims**



1. In a press which engages a flywheel to impart energy to reciprocate a ram through interconnected drive components, said press having air-operated cylinder means for automatically counterbalancing the downward working force of said ram, an improved system for adjusting the counterbalancing air pressure in said air cylinder means according to the energy level of the flywheel comprising:

sensor means for detecting the speed of said ram which is indicative of the energy level of said flywheel; and

control means for comparing the speed of said ram detected by said sensor means to a predetermined value and increasing or decreasing the air pressure in said air cylinder means according to said comparison to overcome under or over counterbalancing of said ram.

5,009,092

COILER ARRANGEMENT

Rudolf Buchegger, Florian, assignor to Voest-Alpine Industrieanlagenbau GmbH, Linz, Austria

Filed May 16, 1990, Ser. No. 525,161
Claims priority, application Austria, Jun. 8, 1989, 1413/89
Int. Cl.[5] B21C *47/04*
U.S. Cl. 72—148 **7 Claims**

1. In a coiler arrangement for coiling hot metal rolling stock comprising a coiler mandrel rotatably mounted within a housing having a peripheral opening through which rolling stock is guided for coiling around said mandrel,

said arrangement also including a roller table cooperatively disposed relative to said housing and formed of a plurality of table rollers defining a roller way upon which said rolling stock is transported to said coiler via said opening in said housing and guided to said mandrel by means of a pivot flap cooperatively associated with said roller table,

said pivot flap extending from said roller table to the vicinity of said mandrel,

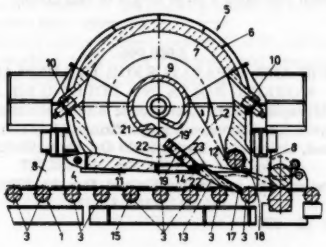
said pivot flap being provided with means for actuating said

flap into a position for guiding said rolling stock to said mandrel,

the improvement which comprises:

a pivot flap assembly pivotably mounted on said housing by axle means located adjacent the peripheral opening thereof,

said pivot flap assembly extending across said peripheral opening and having a first flap portion with its free end



extending forwardly of said axle means and a second flap portion extending rearwardly thereof,

said flap portions cooperating one with the other for closing off said opening and providing sufficient space to allow for passage of said rolling stock to said mandrel,

and pivot drive means cooperatively associated with said housing for actuating said pivot flap assembly from an open to a closed position and vice versa.

5,009,093

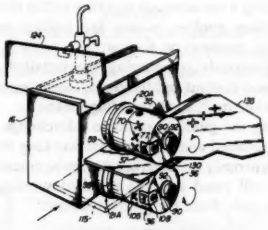
APPARATUS AND METHOD FOR ROLL FORMING AND MARKING SHEET METAL

F. Dillard Quinn, Jr., 775 Beech Valley Rd., and Anthony W. Quinn, 3611 Briar Dr., both of Lithia Springs, Ga. 30057

Continuation of Ser. No. 424,730, Oct. 20, 1989, abandoned. This application Nov. 5, 1990, Ser. No. 610,337

Int. Cl.[5] **B21D** *35/00*

U.S. Cl. 72—177 **3 Claims**



1. Apparatus for roll-forming sheet metal into air duct pipe having a predetermined part size, comprising:

a pair of opposing and substantially parallel roller support frames spaced from one another;

a plurality of first shafts rotatably mounted to and along each of the opposing roller support frames, the plurality of first shafts extending inwardly from each of the opposing roller support frames towards the opposite roller support frame;

a plurality of second shafts rotatably mounted to and along each of the opposing roller support frames, the plurality of second shafts extending inwardly from each of the opposing roller support frames towards the opposite roller support frame, each of the plurality of second shafts positioned juxtapositional to a corresponding first shaft;

a plurality of first forming rollers mounted on corresponding first shafts;

a plurality of second forming rollers mounted on corresponding second shafts, each first forming roller being positioned juxtapositional to a corresponding second forming roller so that there is a nip between each of the juxtaposed first and second forming rollers, the juxtaposed first and second forming rollers forming a pair of opposing roll forming lines;

a first embossing roller mounted on one of said first shafts and extending inwardly from the first forming roller mounted on the one of said first shafts to a substantially exposed forward end, the first embossing roller being separate from the first forming roller mounted on the one of said first shafts, the first embossing roller extending beyond each of the first forming rollers in the associated roll forming line towards the opposing roll forming line, the first embossing roller having an outer surface and a relief pattern extending outwardly therefrom, the relief pattern including an indication of the predetermined part size of the air duct pipe;

a second embossing roller mounted on the second shaft positioned juxtapositional to the one of said first shafts on which the first embossing roller is mounted, the second embossing roller extending inwardly from the second forming roller mounted on the associated second shaft to a substantially exposed forward end, the second embossing roller being separate from the second forming roller on the associated second shaft, the second embossing roller extending beyond each of the second forming rollers in the associated roll forming line towards the opposing roll forming line, the first and second embossing rollers juxtaposed so that there is a nip therebetween, the second embossing roller having an outer surface which has an engraved pattern for receiving the relief pattern, the engraved pattern being substantially identical to the relief pattern; and

means for rotating the first and second shafts so as to draw the sheet metal through the nips between the first and second forming rollers and the first and second embossing rollers,

whereby the sheet metal is simultaneously roll formed into air duct pipe by the first and second forming rollers and embossed with the identifying relief pattern by the first and second embossing rollers.

5,009,094

METHOD OF ROLLING H-SHAPED STEELS

Hiroyuki Hayashi, Chiba; Tsuneo Seto, Kurashiki; Hironori Miura, Kurashiki, and Yoji Fujimoto, Kurashiki, all of Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

Filed Jun. 19, 1989, Ser. No. 367,947

Claims priority, application Japan, Jun. 27, 1988, 63-156828; Jun. 29, 1988, 63-159518; Sep. 20, 1988, 63-233393; Feb. 10, 1989, 1-29995

Int. Cl.[5] **B21B** *13/08, 41/06*

U.S. Cl. 72—225 **3 Claims**

1. A method of manufacturing H-shaped steels comprising the steps of:

subjecting a workpiece to break down rolling by passing the workpiece at least once through a break down rolling mill, the work piece after break down rolling composed of a web portion and a pair of flange portions;

subjecting the workpiece to rough universal rolling by passing the workpiece at least once through a rough universal rolling mill;

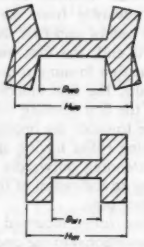
subjecting the workpiece to finish universal rolling by passing the workpiece at least once through a finish universal rolling mill;

subjecting said workpiece to web-reduction universal rolling in any position ranging from final pass of said rough universal rolling to said finish universal rolling, wherein the inner width of said web of said workpiece is decreased by

an amount within a range not exceeding $80 \times T_W^2/B_W$, wherein T_W is the thickness of said web portion of said workpiece and B_W is the inner width of said web portion of said workpiece;

wherein concurrently with said reduction of said web inner width, the thickness of said flange of said workpiece is reduced;

wherein said step of web-reduction universal rolling at any



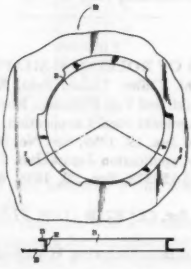
position ranging from final pass of said rough universal rolling to said finish universal rolling comprises the step of passing the workpiece at least once through a universal rolling mill, where the rolling mill comprises a pair of upper and lower width variable horizontal rolls and a pair of left and right vertical rolls, and wherein the roll width of each of said width variable horizontal rolls is set to a smaller length than said inner width of the web of said workpiece.

5,009,095

METHOD FOR FORMING A COLLARED HOLE IN SHEET MATERIAL

Harlan F. Voss, Punta Gorda, Fla., assignor to Tridan Tool & Machine, Inc., Danville, Ill.

Filed Jan. 9, 1990, Ser. No. 462,618
Int. Cl.[5] B21D *28/26*
U.S. Cl. 72—335 **6 Claims**



1. A method of producing a collard hole in a sheet of material comprising the steps of:

moving a sheet through a die;

sequentially stopping said sheet at multiple stations;

forming with a plurality of first punches a plurality of first holes in said sheet in a certain size and configuration for each collared hole to be formed in said sheet while leaving said first holes spaced apart so material of said sheet extends between said first holes;

removing with a main punch some of said material from between said first holes to transform said plurality of first holes into a single main hole having a center and with portions of material extending inwardly and terminating a distance from said center of said main hole;

extending a straightening punch through said single main hole after said removing step to draw said sheet around said main hole forming a collar of a predetermined height which extends perpendicularly from said sheet; and,

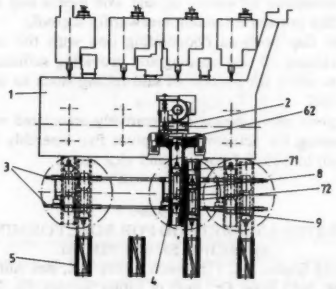
controlling and varying said predetermined height by keeping said certain size and configuration of said first holes fixed while selecting the radius of said main punch (1) to increase said distance with a large radius of said main punch providing a small height of said collar and (2) reduce said distance with a small radius of said main punch providing a large height of said collar.

5,009,096

METHOD AND APPARATUS FOR THE REPLACING OF WORKING ROLLS IN A ROLLING MILL

Matti Mäenpää; Teuvo Lehtoluoma; Kauko Henttinen; Pertti Jokipalo; Aimo Saren, and Seppo Pirinen, all of Hämeenlinna, Finland, assignors to Rautaruukki Oy, Oulu, Finland

Filed Dec. 21, 1989, Ser. No. 454,757
Claims priority, application Finland, Dec. 22, 1988, 885953
Int. Cl.[5] B21B *31/07*
U.S. Cl. 72—239 **14 Claims**



1. A method for replacing an installed working roll in a rolling mill having a roll stand receiving the installed working roll, a roll track, a car which runs parallel to the roll track and is alignable with the installed working roll, and a storage rack near the roll stand; the method comprising:

(a) providing a replacement working roll in the storage rack;

(b) providing guiding means, for guiding working rolls, rotatably mounted on the car;

(c) simultaneously transferring the installed working roll from the roll stand and the replacement working roll from the storage rack, to the guiding means;

(d) rotating the guiding means to interchange the positions of the installed and replacement working rolls; and

(e) simultaneously transferring the replacement working roll to the roll stand and the installed working roll to the storage rack, from the guiding means.

5,009,097

PLANT OR APPARATUS UTILIZING A UNIVERSAL STRAIGHTENING-BENDING MACHINE

Marcello Del Fabro, and Giorgio Del Fabro, both of Reana Del Rojale, Italy, assignors to M.E.P. Macchine Elettroniche Piegatrici S.p.A., Italy

Filed Nov. 17, 1989, Ser. No. 438,771
Claims priority, application Italy, Nov. 23, 1988, 83532 A/88
Int. Cl.[5] B21D *7/024*
U.S. Cl. 72—387 **6 Claims**

1. A straightening-bending apparatus for wire stock feed comprising in combination, a working table pivotable about a table horizontal axis including:

advancing and straightening means with opposed rolls to straighten and longitudinally advance the wire stock on

said working table including guiding means for guiding the feed stock along the working table;

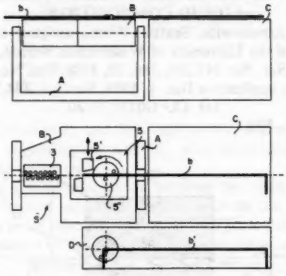
cutting means receiving the wire stock feed from said advancing and straightening means provided on said table for cutting said wire stock feed

bending means for bending said stock material receiving said wire stock feed from said cutting means

wherein the working table is pivotable at an angle β from a generally vertical orientation about said table horizontal axis:

from a first generally horizontal position ($\beta^\circ=90^\circ$) where the table faces upwardly

to a second positive inclined position ($0^\circ<\beta^\circ<90^\circ$) in which the working table faces forwardly and upwardly with respect to said longitudinal feed path;



to a third vertical position ($\beta^\circ=0^\circ$) in which the working table faces forwardly with respect to said longitudinal feed path;

to a fourth negatively inclined position ($0^\circ<-\beta^\circ<90^\circ$) in which the working table faces forwardly and downwardly with respect to said longitudinal feed path,

and wherein:

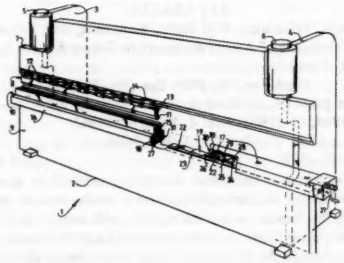
the respective working table is displaced downwardly with respect to the longitudinal feed path when the working table is moved to said third vertical position and said fourth negatively inclined position so that wire stock can free fall downwardly from said straightening means, cutting means and bending means.

5,009,098

PRESS AND CURVE-FORMING MEANS THEREFOR

Jacobus L. van Merksteijn, Stad Delden, Netherlands, assignor to Machinefabriek Wila B.V., Lochem, Netherlands

Filed Nov. 27, 1989, Ser. No. 441,106
Int. Cl.[5] B21D *5/02*; B21J *13/03*
U.S. Cl. 72—389 **18 Claims**



1. A press, comprising:

a frame which bears bending means, the bending means including an upper tool and a lower tool which can be moved in a mutually reciprocal matter;

curve forming means associated with the bending means for forming a curve on the bending means, the curve-forming means including curve-forming members slidable over each other in a lengthwise direction and in a transverse direction relative to the bending means and making contact with each other, the contact surfaces of the curve-forming members in the lengthwise direction and the transverse direction possess respective determined angles of slope α and β; and

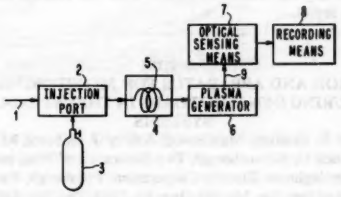
means for adjusting the curve-forming members in the lengthwise direction and the transverse direction.

5,009,099

BACKGROUND CORRECTION METHOD FOR USE IN GAS CHROMATOGRAPHY

Gregory J. Wells, Suisun, and Barbara A. Bolton, Albany, both of Calif., assignors to Varian Associates, Inc., Palo Alto, Calif.

Filed May 9, 1989, Ser. No. 349,201
Int. Cl.[5] G01D *18/00*; G01N *21/73*
U.S. Cl. 73—1 G **3 Claims**



1. A method of correcting for changes in background radiation in a plasma emission detector comprising a plurality of sensors associated with specific emission frequencies including a sensor associated with at least one principal carbon emission frequency and another sensor associated with a frequency of emission of another element,

each time a new source of helium is connected to the system generating a calibration curve which correlates the response at the said other sensor in the absence of the other element of interest with the response at said carbon sensor,

storing said calibration curve in system memory,

thereafter, measuring the signal response at said carbon sensor,

simultaneously measuring the signal response at said other sensor,

subtracting from the signal from said other sensor an amount determined from the calibration curve stored in said system memory.

5,009,100

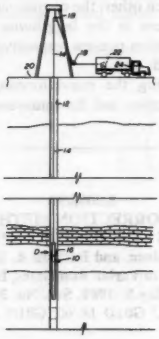
DOWN HOLE RESERVOIR FLUID SAMPLER

Norman G. Gruber, and Owen T. Krauss, both of Calgary, Canada, assignors to Western Atlas International, Inc., Houston, Tex.

Filed Nov. 16, 1989, Ser. No. 437,687
Claims priority, application Canada, Nov. 17, 1988, 583396
Int. Cl.[5] E21B *49/08*
U.S. Cl. 73—155 **30 Claims**

1. An apparatus, suspended in a bore hole from the surface of the earth, for taking a sample of a fluid from the bore hole, comprising in combination: a housing having at least one port and an interior volume, means for opening the port thereby placing the volume in fluid communication with the fluid in the bore hole, means within the volume for accepting the fluid from the bore hole at a predetermined rate so as not to alter the

fluid, means within the volume for agitating the bore hole fluid received therein, and means within the housing for closing the



port, sealing the bore hole fluid within the volume once the volume is full.

5,009,101

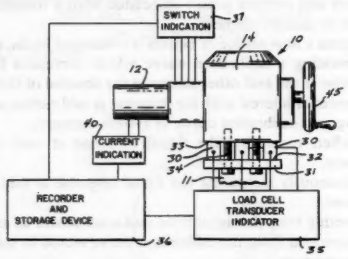
METHOD AND APPARATUS FOR MONITORING AND MEASURING DYNAMIC LOADS IN THRUST INDUCING SYSTEMS

Timothy R. Branam, Manitowoc; Jeffrey J. Roberts, Michicot, and Jack O. Schoenberger, Two Rivers, all of Wis., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Division of Ser. No. 144,949, Jan. 19, 1988, Pat. No. 4,856,327. This application Jun. 8, 1989, Ser. No. 363,048

Int. Cl.[5] G01M *19/00*

U.S. Cl. 73—168 **5 Claims**



1. In a valve and valve operator assembly including a valve body, a valve plug within the body movable to and between the valve open position and a valve closed position, a valve stem attached to the valve plug, the valve operator assembly including a source of motive power, an operator housing attached to the valve body to provide an attachment interface therebetween, and power transmission means operatively connecting the power source and the valve stem and disposed to transmit an operating load from the power source to the stem for effecting movement of the valve plug, and limit switch and torque switch means operatively attached to the power transmission means and power source for terminating the output of the power source at the valve open position and the valve closed position, a method for monitoring and analyzing the operation of the valve and valve operator assembly comprising the steps of:

(a) attaching load sending means to the attachment interface for continuously measuring a directly proportional part of the actual valve stem operating loads as the valve plug is moved between its open and closed positions;

(b) converting the measured loads into the actual valve stem operating loads;

(c) generating an output indication of the actual valve stem operating loads as a function of valve plug position;

(d) concurrently with step (a), monitoring the operation of the limit switch and torque switch means;

(e) generating an output indication of the limit switch and torque switch means operation as a function of valve plug position;

(f) correlating the output of steps (c) and (e); and

(g) utilizing the correlation from step (f) to analyze the operation of the assembly.

5,009,102

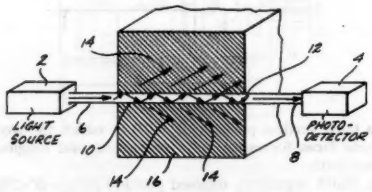
METHOD OF MONITORING SOLIDIFICATION OF A LIQUID COMPOSITION

Martin A. Afromowitz, Seattle, Wash., assignor to Board of Regents of the University of Washington, Seattle, Wash.

Division of Ser. No. 147,234, Jan. 22, 1988, Pat. No. 4,904,080. This application Dec. 1, 1989, Ser. No. 444,754

Int. Cl.[5] G01N *29/20*

U.S. Cl. 73—590 **8 Claims**



1. A method of monitoring a process wherein a liquid composition passes from a liquid phase to a solid phase comprising the steps:

(a) dispersing particles having an acoustic impedance Z_1 in the liquid composition having an acoustic impedance Z_2, such that Z_1 and Z_2 are unequal, the solid phase of the liquid composition having an acoustic impedance Z_3 that is substantially equal to Z_1;

(b) providing a solidifying composition by subjecting the liquid composition containing the particles to conditions that cause the liquid composition to solidify;

(c) introducing acoustic waves into the solidifying composition containing the particles; and

(d) detecting the introduced acoustic waves scattered by the particles.

5,009,103

ULTRASONIC THICKNESS MEASURING METHOD AND APPARATUS

Izumi Sato, Yokosuka; Koji Saito, Kawasaki, and Takashi Inoue, Tokyo, all of Japan, assignors to Tokyo Keiki Co., Ltd., Tokyo, Japan

Filed Jan. 31, 1989, Ser. No. 304,445

Claims priority, application Japan, Feb. 1, 1988, 63-21681; Feb. 1, 1988, 63-21682; Feb. 4, 1988, 63-14063

Int. Cl.[5] G01N *9/24*

U.S. Cl. 73—597 **8 Claims**

1. An ultrasonic thickness measuring method in which an ultrasonic pulse is transmitted from a probe into a material having a thickness to be measured, and resulting multiple reflection pulses from the material are detected to obtain a time interval between the reflection pulses to derive the thickness of the material, said method comprising the steps of:

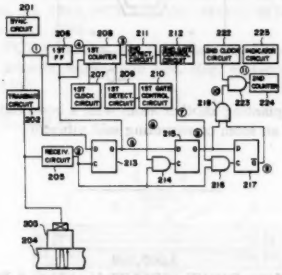
transmitting an ultrasonic pulse into a material whose thickness is to be measured;

detecting a first reflection pulse from a bottom surface of said material;

measuring a first time period from the transmission of the ultrasonic pulse to reception of said first reflection pulse;

detecting a second reflection pulse received within a preset period of time occurring after said first reflection pulse has been received, said preset period of time ending immediately prior to the end of a second time period corresponding in duration to said first time period, said second time period beginning immediately after detecting said first reflected pulse; and

measuring a third time period between the reception of the first reflection pulse and the reception of the second reflection pulse whereby said third time period corresponds to a measure of the thickness of the material.

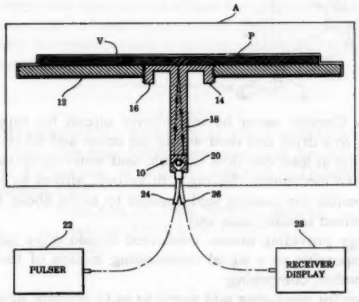


5,009,104

ULTRASONIC CURE MONITORING OF ADVANCED COMPOSITES

Delwin O. Johnson, San Diego, Calif., assignor to General Dynamics Corporation, San Diego, Calif.

Filed Nov. 30, 1989, Ser. No. 443,637
Int. Cl.[5] G01N *29/16, 9/24*
U.S. Cl. 73—597 **15 Claims**



1. A non-destructive method for monitoring the time dependent curing of an advanced composite positioned within an autoclave where it is subjected to varying pressure and temperature over a predetermined period of time, which method comprises:

positioning an uncured advanced composite secured within a vacuum bag and carried by a tool within an autoclave;

varying the heat and pressure within the autoclave over a predetermined period of time to cure the composite;

coupling an acoustic waveguide to one side of the uncured advanced composite by extending said acoustic waveguide through an aperture provided in said tool so that the wave guide may be directly coupled to a surface of the composite;

directing a pulse of ultrasound energy through the waveguide to the side of the advanced composite; and

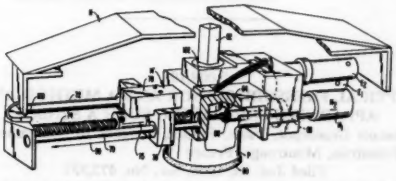
analyzing the ultrasound energy reflected from the side of the advanced composite to determine the modulus of the advanced composite at a particular point in its curing.

5,009,105

APPARATUS FOR ULTRASONIC EXAMINATION OF BWR SHROUD ACCESS COVER PLATE RETAINING WELDS

David L. Richardson, Los Gatos; Jack P. Clark; Balasubramanian S. Kowdley, both of San Jose; Peter M. Patterson, Livermore; Richard W. Perry, and Thurman D. Smith, both of San Jose, all of Calif., assignors to General Electric Company, San Jose, Calif.

Division of Ser. No. 293,158, Jan. 3, 1989, Pat. No. 4,966,746.
This application Feb. 7, 1990, Ser. No. 476,086
Int. Cl.[5] G01N *29/04*
U.S. Cl. 73—621 **1 Claim**



1. An apparatus for the submersed inspection of a cover plate welded over an access hatch in a remote submerged location in a nuclear reactor, said apparatus comprising:

an elongate housing having a top side, a bottom side, and two sides;

the top side of said housing having at either end thereof upwardly exposed support points for raising and lowering of said housing;

said housing at the bottom side having an attached protruding pedestal, said pedestal provided for resting rotative support of said housing thereon;

a first motor operably connected between said pedestal and housing for causing said housing to rotate relative to said pedestal;

said housing bottom defining between said pedestal and one end of said housing an elongate slot for permitting sound waves to pass therethrough;

a ultrasound mount mounted to said housing for reciprocal movement along said slot;

a focused ultrasound transducer mounted to said mount for acoustical interrogation through water of metal disposed below said housing;

a second motor operatively connected between said housing and mount for causing relative excursion of said mount and transducer along said elongate slot of said housing whereby said housing and rotate and acoustically interrogate metal disposed about the pedestal.

5,009,106

ACCELEROMETER WITH IMPROVED SHOCK RESISTANCE

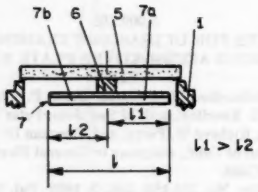
John M. Kubler, Amherst, and Michael D. Insalaco, Niagara Falls, both of N.Y., assignors to Kistler Instrumente AG, Winterthur, Switzerland

Filed Jul. 6, 1989, Ser. No. 376,010
Int. Cl.[5] G01P *15/09*
U.S. Cl. 73—651 **5 Claims**

1. Accelerometer for the measurement of an axial acceleration, with a sensor part comprising:

an electromechanical beam having two beam sections of unequal lengths;

a beam carrier;



a spacer connecting said beam and said beam carrier; and

said beam being glued to the spacer, at bevelled gluing surfaces.

5,009,107

OPTICAL PRESSURE SENSOR AND A METHOD AND APPARATUS FOR MAKING SUCH A SENSOR

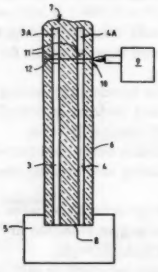
Francois Grasdepot, Paris, France, assignor to Schlumberger Industries, Montrouge, France

Filed Jan. 30, 1990, Ser. No. 472,537

Claims priority, application France, Feb. 2, 1989, 89 01361

Int. Cl.[5] G01L *7/04*

U.S. Cl. 73—705 **6 Claims**



1. An optical absolute pressure sensor constituted by a body made of a substance having photoelastic properties and provided with at least one internal duct extending parallel to the longitudinal direction of said body, the pressure inside said duct being substantially zero and the ends thereof being closed by sealing without addition of external material.

5,009,108

VIBRATING TYPE TRANSDUCER

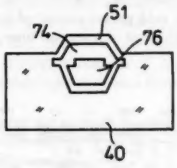
Kinji Harada; Kyoichi Ikeda; Hideki Kuwayama; Takashi Kobayashi; Tadashi Nishikawa; Tetsuya Watanabe, and Takashi Yoshida, all of Tokyo, Japan, assignors to Yokogawa Electric Corporation, Tokyo, Japan

Division of Ser. No. 245,681, Sep. 16, 1988. This application Oct. 18, 1989, Ser. No. 423,042

Int. Cl.[5] G01L *11/00*

U.S. Cl. 73—704 **1 Claim**

1. In a vibrating type transducer for measuring a physical quantity relating to strain applied to opposite ends of a beam like vibrator fixed on a silicon substrate through measuring a resonance frequency of the vibrator, the improvement comprising a vibrator to which a predetermined initial tension is



given by implanting another atom with a bond radius smaller than that of an atom constructing said vibrator.

5,009,109

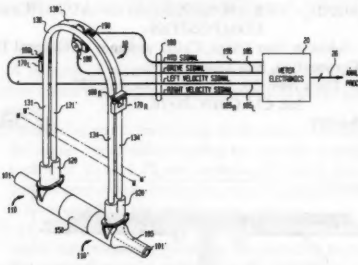
FLOW TUBE DRIVE CIRCUIT HAVING A BURSTY OUTPUT FOR USE IN A CORIOLIS METER

Paul Kalotay, Lafayette; Robert Bruck, Boulder; Arnold Emch, Estes Park, and Donald Martella, Louisville, all of Colo., assignors to Micro Motion, Inc., Boulder, Colo.

Filed Dec. 6, 1989, Ser. No. 446,614

Int. Cl.[5] G01F *1/84*

U.S. Cl. 73—861.38 **15 Claims**



1. A Coriolis meter having a drive circuit for supplying energy to a drive coil used within the meter and wherein the meter has at least one flow conduit, said meter comprising:

a drive mechanism, having a drive coil, affixed to a flow conduit for causing said conduit to move about a pre-defined bending axis; and

energy providing means, connected to said drive coil and responsive to a signal representing motion of the flow conduit, comprising:

means for measuring said signal so as to produce measured values thereof;

means, responsive to said measured values, for determining whether the signal has an amplitude value that is less than a limit value at a pre-defined point on said signal; and

applying means, responsive to said determining means, for providing a pre-defined burst of energy to said drive coil at a pre-defined point in a cycle of oscillatory movement of said flow conduit in the event said amplitude value is less than said limit value and for providing substantially no energy to said coil during said cycle other than when said burst occurs, wherein said applying means provides substantially no energy to said drive coil anytime during said cycle in the event said amplitude value equals or exceeds said limit value such that said flow conduit oscillates with a peak amplitude that remains substantially within a prescribed range.

5,009,110

TORQUE SENSOR, IN PARTICULAR FOR ELECTRIC STEERING MECHANISM

Armin Lang, Schwäbisch Gmünd, and Bernhard Schweizer, Böbingen/Rems, both of Fed. Rep. of Germany, assignors to Zahnradfabrik Friedrichshafen, AG., Friedrichshafen, Fed. Rep. of Germany

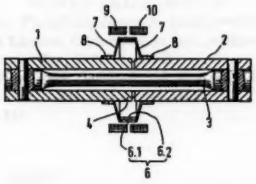
PCT No. PCT/EP88/00063, § 371 Date Jul. 12, 1989, § 102(e) Date Jul. 12, 1989, PCT Pub. No. WO88/05742, PCT Pub. Date Aug. 11, 1988

PCT Filed Jan. 29, 1988, Ser. No. 381,406

Claims priority, application Fed. Rep. of Germany, Feb. 3, 1987, 3703102

Int. Cl.[5] **G01L** *3/10*

U.S. Cl. 73—862.33 **27 Claims**



1. A torque sensor particularly for electric steering mechanisms and which has a torque bar (3) with input means (1, 2) (21, 22) (31, 32) secured thereon; output means (6, 6.1, 6.2) (12, 13) (26); connecting means connecting each said input means to said output means and comprising a respective array of flexible elements secured to respective input means and the output means; the improvement comprising:

a lost motion connection between said input means; said flexible elements comprising a conical array of plastic spokes (7) carrying said output means; wherein spokes (7) on one side of respective the input means are circumferentially slanted in an opposite direction to the spokes on the other side whereby relative bi-directional rotation between said input means effects a respective axial opposite movement of said output means; and means responsive to said movement of said output means to effect torque measurement.

5,009,111

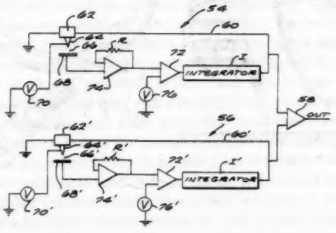
DIFFERENTIAL FORCE BALANCE APPARATUS

Paul West, Glendale; Mirik Hovsepian, and Ronald Thomas, both of Pasadena, all of Calif., assignors to Quanscan, Inc., Pasadena, Calif.

Filed Aug. 31, 1988, Ser. No. 239,365

Int. Cl.[5] **G01L** *1/08;* **G01P** *15/13*

U.S. Cl. 73—862.61 **20 Claims**



12. A force measurement apparatus which comprises:

a first element incorporating a first electrode;

a second electrode in a spaced-apart relationship to said first electrode;

means for causing a current to exist between said first and second electrodes by non-contact electron transfer mechanisms;

first distance maintenance means for maintaining the distance between said first and second electrodes at a constant value, said first maintenance means having a measurable electrical property when maintaining the distance at the constant value;

a second element incorporating a third electrode;

a fourth electrode in spaced apart relationship to said third electrode;

means for causing a current to exist between said third and fourth electrodes by non-contract electron transfer mechanisms;

second distance maintenance means for maintaining the distance between said third and fourth electrodes at a constant value, said second maintenance means having a measurable electrical property when maintaining the distance at the constant value; and

means for measuring the electric properties of said first and second distance maintenance means.

5,009,112

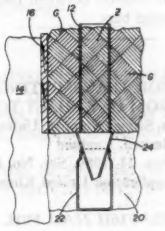
METHOD AND APPARATUS FOR CONDUCTING FIELD DISSIPATION AND LEACHING STUDIES

Lowell J. Lawrence, Lexington, Ky.; Luis O. Ruzo, Berkley, Calif., and Gene L. Olson, Lexington, Ky., assignors to Pharmacology & Toxicology Research Lab., Richmond, Ky.

Filed May 5, 1989, Ser. No. 351,916

Int. Cl.[5] **G01N** *1/00*

U.S. Cl. 73—866 **15 Claims**



1. A method for conducting field dissipation and leachate studies of a test substance utilizing boundary means to define a soil test zone and collecting means for collecting leachate from said soil test zone, comprising the steps of:

positioning said boundary means into the ground;

exposing, a bottom end of said boundary means which remains undisturbed in place in said ground substantially without disturbing said soil test zone;

collecting leachate from said soil test zone within said boundary means; and

analyzing said leachate.

9. An apparatus for conducting field dissipation and leachate studies of a test substance, comprising: p1 boundary means for positioning into the ground to define a soil test zone, said boundary means being a column that is driven into the ground substantially without disturbing or compacting soil in said soil test zone; and

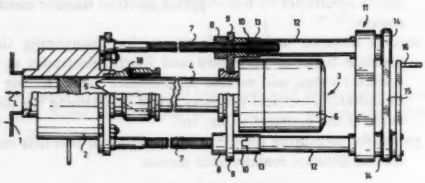
means for collecting leachate from a bottom end of said boundary means left undisturbed in place in said ground.

5,009,113

ARRANGEMENT FOR DISPLACING A MEASURING HEAD OF A MEASURING MEANS INTO AND FROM A PROCESS SPACE

Esko Kamrat, Vantaa, Finland, assignor to Janesko Oy, Helsinki, Finland

Filed Mar. 6, 1990, Ser. No. 489,000
Claims priority, application Finland, Apr. 20, 1989, 891894
Int. Cl.[5] G01N *17/00*
U.S. Cl. 73—866.5 4 Claims



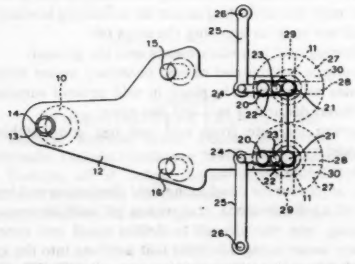
1. An arrangement for displacing a measuring head of a measuring means into and from a process space, which arrangement comprises a valve element to be fastened to a wall of the process space and a measuring means to be fastened to the valve element, which measuring means comprises an oblong tube, at one end of which is a measuring head, the measuring means being arranged to be moved through the valve element to a position in which the measuring head extends into the process space and back again to a position in which the measuring head is not in connection with the process space, said arrangement comprising at least two threaded bars parallel to the displacement direction of the measuring means and fastened directly to the valve element and at least two threaded stop elements in the form of bushings rotatably mounted on a flange located on the measuring means and arranged to directly cooperate with the threaded bars, the threaded stop elements being provided with joining elements for the fastening of a device for the rotation of the stop elements, and displacing motion of the measuring means being provided by relative motion between the threaded stop elements and the threaded bars.

5,009,114

MECHANISM FOR TRANSMITTING ROTATIONAL MOTION FROM ONE SHAFT TO ANOTHER

Bryan N. V. Parsons, Stoney Stanton, United Kingdom, assignor to Jaguar Cars Limited, England

Filed Nov. 21, 1989, Ser. No. 439,786
Claims priority, application United Kingdom, Nov. 24, 1988, 8827432
Int. Cl.[5] F16H *21/00;* F01L *1/00*
U.S. Cl. 74—15.63 10 Claims



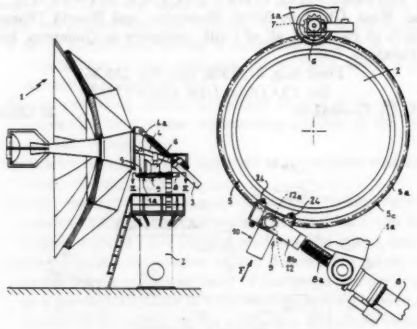
1. A mechanism for transmitting rotational motion from an input shaft to an output shaft comprising a link constrained to move in an orbital path, the input shaft being coupled to the link so that rotation of the input shaft will move the link in its orbital path; and the output shaft being parallel to the said input shaft and coupled to the link so that orbital motion of the link will rotate the output shaft; the coupling between at least one of the shafts and the link including interengaging components the relative positions of which vary as the link moves in its orbital path, one of said components being mounted on the said one of the shafts for rotation therewith and another of said components being mounted on the link for pivotal movement relative thereto, the component mounted on the link being positioned such that as the link moves in its orbital path, and axis of the pivotal movement will describe a circular path concentric with the axis of rotation of the said one of the shafts, a lever being pivotally connected at one end to the component mounted on the link and at its other end to a pivot which is isolated from the movement of the link.

5,009,115

DEVICE FOR DRIVING IN ROTATION A STRUCTURE OF LARGE DIAMETER PARTICULARLY AN ANTENNA

Patrice Ringot, Grenoble, and Parendel Marc, Moirans, both of France, assignors to Neyrpic Framatome Mecanique, Paris la Defense, France

Filed Mar. 9, 1990, Ser. No. 491,174
Claims priority, application France, Mar. 10, 1989, 89 03431
Int. Cl.[5] F16H *27/020, 57/020;* F16M *11/120;* H01Q *3/000*
U.S. Cl. 74—89.150 12 Claims



1. An apparatus for rotating a structure such as an antenna wherein the structure is mounted to a support pedestal having a ring gear mounted therebetween and wherein the ring gear includes a plurality of teeth comprising, a first adjustment means including a motor having a drive shaft, pinion means

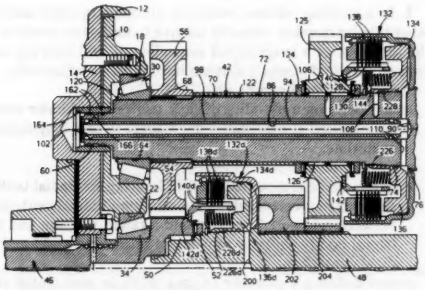
mounted to said drive shaft and engaging said teeth of said ring gear so as to rapidly rotate the structure about an axis taken through the ring gear when said motor is activated; a second adjustment means for enabling a slower exacting rotation of the structure about said axis, said second adjustment means including a jack means having an extensible member, a coupling member carried by said extensible member, said coupling member including shiftable engaging means for selectively engaging said teeth of said ring gear and for disengaging said coupling member from said ring gear in order to permit the rapid rotation of the structure by said first adjustment means.

5,009,116

POWER TRANSMISSION

James P. Ordo, Plainfield; James A. Raszkowski, Indianapolis, and Donald Klemen, Carmel, all of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Mar. 30, 1990, Ser. No. 502,195
Int. Cl.[5] F16H *3/08*
U.S. Cl. 74—331 **3 Claims**



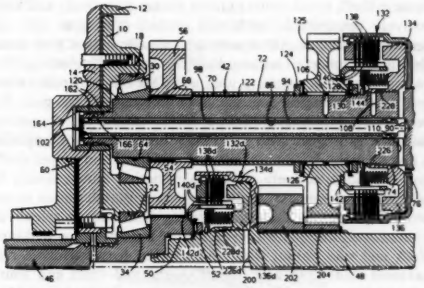
1. A transmission comprising: a housing having first and second end covers; an input shaft rotatably mounted in the first end cover; an output shaft rotatably supported on the input shaft and in said second end cover; first and second countershafts rotatably supported in said end covers for rotation on respective axis parallel with said input shaft and said output shaft; a first head gear continuously rotatable with said input shaft; second and third head gears meshing with said first head gear and continuously rotatable with the first and second countershafts respectively; a plurality of ratio gears rotatably supported on each of said countershafts including a first ratio gear on said first countershaft and a second ratio gear on said second countershaft; reverse gear means including a first member rotatable with said first ratio gear and a second member rotatably supported on said second countershaft; synchronizer clutch means selectively and alternatively connectible with said second ratio gear and said second member of said reverse gear means; output gear means drivingly connected with said output shaft and including a first ratio output gear meshing with said first ratio gear and a second ratio output gear meshing with said second ratio gear; first selectively engageable friction clutch means for connecting said first ratio gear with said first countershaft for completing a low forward drive ratio between said input and output shafts; and second selectively engageable friction clutch means for selectively connecting said synchronizer clutch means to said second countershaft and cooperating therewith to selectively alternatively complete a reverse drive ratio between said input shaft and said output shaft and another forward drive ratio between said input and output shafts, said reverse drive ratio being transmitted to said output shaft through said first ratio gear and said first ratio output gear.

5,009,117

COUNTERSHAFT POWER TRANSMISSION WITH DOWEL PIN AND SEAL RING STRUCTURE

James P. Ordo, Plainfield, and Harry E. Latshaw, Danville, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Mar. 30, 1990, Ser. No. 502,196
Int. Cl.[5] F16H *3/08*
U.S. Cl. 74—331 **2 Claims**



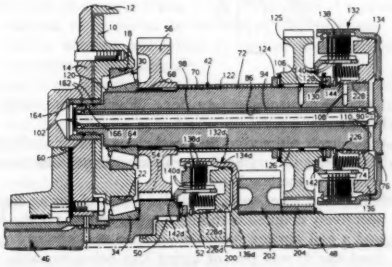
1. A multiple countershaft power transmission comprising: a casing including a bell housing, an outer housing, and an end cover; an assembly support plate having bearing locations for supporting bearings; an input shaft rotatably supported on one bearing in said support plate; a pair of countershafts rotatably supported on second and third bearings in said support plate, each of said countershafts having a centrally disposed clutch engagement passage and an annular clutch lubrication passage; a dowel and seal sleeve member secured in the bell housing for each countershaft including a surface for locating the support plate for positioning of said support plate during securement with said bell housing; a radial passage for communicating fluid with said annular lubrication passage; and an axial end opening for communicating fluid pressure with said central clutch engagement passage.

5,009,118

POWER TRANSMISSION WITH PARALLEL IDENTICAL COUNTERSHAFTS

James A. Raszkowski, Indianapolis, and Donald Klemen, Carmel, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Mar. 30, 1990, Ser. No. 502,198
Int. Cl.[5] F16H *3/08*
U.S. Cl. 74—331 **2 Claims**



1. An improvement in multiple countershaft transmissions including: a housing having a casing, a first end support and a second end support; an input shaft rotatably mounted in the first end support; an output shaft rotatably supported on the input shaft and in said casing; first and second countershafts

rotatably supported in one of said end supports and in said casing for rotation on respective axis parallel with said input shaft and said output shaft; a first head gear continuously rotatable with said input shaft; second and third head gears meshing with said first head gear and continuously rotatable with the first and second countershafts respectively; a plurality of ratio gears rotatably supported on each of said countershafts including a first ratio gear on said first countershaft and a second ratio gear on said second countershaft; reverse gear means including a first member rotatable with said first ratio gear and a second member rotatably supported on said second countershaft; synchronizer clutch means selectively and alternatively connectable with said second ratio gear and said second member of said reverse gear means; output gear means drivingly connected with said output shaft and including a first ratio output gear meshing with said first ratio gear and a second ratio output gear meshing with said second ratio gear; first selectively engageable friction clutch means for connecting said first ratio gear with said first countershaft for completing a low forward drive ratio between said input and output shafts; and second selectively engageable friction clutch means for selectively connecting said synchronizer clutch means to said second countershaft and cooperating therewith to selectively alternatively complete a reverse drive ratio between said input shaft and said output shaft and another forward drive ratio between said input and output shafts, and third and fourth selectively engageable clutch means for selectively establishing two additional forward drive ratios between said input and output shafts; wherein the improvement comprises: said countershafts having identical dimensions from end to end and having centrally disposed clutch mounting structure for mounting respective selectively engageable friction clutch means for selectively connecting said gear means with the respective countershafts.

5,009,119

BRAKE CONTROL APPARATUS FOR BICYCLE

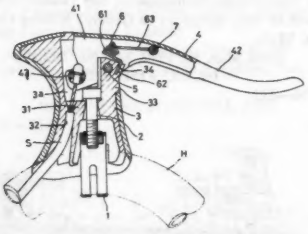
Masashi Nagano, Izumi, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Oct. 4, 1989, Ser. No. 417,031

Claims priority, application Japan, Oct. 7, 1988, 63-132123[U]

Int. Cl.[5] B62K *23/06*; B62L *3/02*

U.S. Cl. 74—489 **7 Claims**



1. A brake control apparatus for a bicycle, comprising:

a bracket;

a brake lever pivoted to the bracket via a lever shaft; and

a lever spring for urging the brake lever to its home position relative to the bracket;

wherein said lever spring includes a pair of spring legs respectively coupled with said bracket and said brake lever and a coil portion disposed between said spring legs, at least one of said pair of spring legs being movable with respect to one of said bracket and said brake lever, said coil portion being arranged such that return movement of said brake lever to its home position relative to said bracket is realized by flexion of a radial center line of said coil portion of the lever spring.

5,009,120

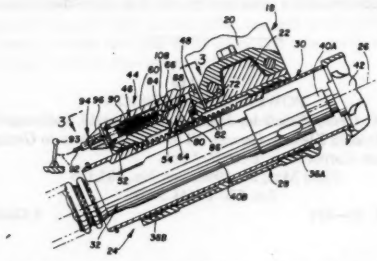
MANUAL CONTROL FOR ADJUSTABLE STEERING COLUMN

Stanley J. Iseler, Midland; Howard D. Beauch, Frankenmuth; Benjamin H. Everett, II, Saginaw, and John P. Sutorik, Frankenmuth, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Feb. 23, 1990, Ser. No. 483,617

Int. Cl.[5] B62D *1/18*

U.S. Cl. 74—493 **5 Claims**



1. In a steering column including an outer member and an inner tubular member movable relative to said outer member in the direction of a longitudinal centerline of said steering column so that said steering column is lengthwise adjustable,

a manual control comprising:

means defining a plurality of rack teeth on said inner member oriented at a predetermined angle to said longitudinal centerline,

a housing on said outer member,

a clutch element mounted on said housing for radial bodily shiftable movement relative to said longitudinal centerline between a lowered position and a raised position and for lateral bodily shiftable movement relative to said longitudinal centerline,

means defining a plurality of rack teeth on said clutch element oriented at said predetermined angle relative to said longitudinal centerline and meshing with said rack teeth on said inner member in said lowered position of said clutch element to immobilize said inner member relative to said outer member in the direction of said longitudinal axis and disengaged from said inner member rack teeth in said raised position of said clutch element,

means defining a first inclined ramp on said clutch element,

means defining a second inclined ramp and a third inclined ramp on said clutch element on opposite sides of said first inclined ramp,

a first spring means on said housing biasing said clutch element toward said raised position,

an actuator on said housing movable in the direction of said longitudinal centerline toward and away from said clutch element and engageable on said first inclined ramp when moving toward said clutch element to drive said clutch element from said raised to said lowered position,

a second spring means biasing said actuator toward said clutch element,

manual operating means connected to said actuator and operative to move said actuator away from said clutch element against said second spring means,

a first side bar on said housing movable in the direction of said longitudinal centerline toward and away from said clutch element and engageable on said second inclined ramp when moving toward said clutch element to drive said clutch element laterally in a first direction,

a third spring means biasing said first side bar toward said clutch element,

a second side bar on said housing movable in the direction of said longitudinal centerline toward and away from said clutch element and engageable on said third inclined ramp

when moving toward said clutch element to drive said clutch element laterally in a second direction opposite said first direction,

a fourth spring means biasing said second side bar toward said clutch element,

means operative to move each of said first and said second side bars away from said clutch element as a unit with said actuator, and

blocking means on said clutch element operative to prevent engagement of each of said first and said second side bars on the corresponding ones of said second and said third inclined ramps until said clutch element achieves substantially said lowered position.

5,009,121

TELESCOPIC STEERING COLUMN DEVICE

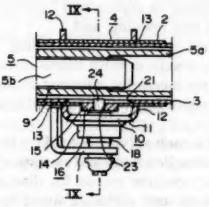
Sakae Matsumoto, Takasaki, and Mitsuo Ichikawa, Maebashi, both of Japan, assignors to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 2, 1990, Ser. No. 546,838

Claims priority, application Japan, Jul. 7, 1989, 1-174064; Jul. 7, 1989, 1-174065; Mar. 27, 1990, 2-30559[U]

Int. Cl.[5] B62D *1/18*

U.S. Cl. 74—493 **3 Claims**



1. A telescopic steering column device comprising:

a drive-side steering shaft an end portion of which is connected to a steering wheel;

a driven-side steering shaft connected to said drive-side steering shaft in such a manner that said drive-side steering shaft can be expanded/contracted and the rotation of said drive-side steering shaft can be transmitted;

a cylindrical inner column rotatably supporting said drive-side steering shaft and having an elongated hole elongated in the axial direction;

a cylindrical outer column having an opening in the side surface thereof corresponding said elongated hole in said inner column, fastened on the outer surface of said inner column so as to be telescopically combined with said inner column and positionally fixed in the axial direction with respect to said driven-side steering shaft;

a lock bracket having a thread hole at its portion corresponding said opening in said outer column and secured to said outer column;

a lock member having a through hole at the central portion thereof and the inner surface thereof which is brought into contact with the outer surface of said inner column, said lock member being arranged to be fitted within said opening in said outer column; and

a lock screw having the inner portion which is engaged with said lock member and a projection which is formed at the central portion of said inner portion, which is rotatably inserted into said through hole of said lock member and which is inserted into said elongated hole in said inner column so that the axial displacement of said inner column with respect to the position of said outer column is allowed while the rotation of said inner column with respect to said outer column is prevented, said lock screw being driven into said thread hole in said lock bracket, whereby said inner column is secured to said outer column by abutting said inner surface of said lock member against the outer surface of said inner column by adjusting said lock screw and said inner column can be expanded/contracted with respect to said outer column by releasing said abutment.

5,009,122

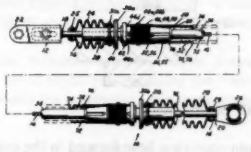
SEALED CABLE CONTROL SYSTEM

Adam W. Chaczyk, Sterling Heights, and John M. Baumgarten, West Bloomfield, both of Mich., assignors to Babcock Industries, Inc., Fairfield, Conn.

Filed Jan. 4, 1990, Ser. No. 461,032

Int. Cl.[5] F16C *1/10*; F16J *15/50*

U.S. Cl. 74—502.6 **6 Claims**



1. A cable control system including respective first and second sealed protective boots,

a sealed conduit connected therebetween,

a pair of air transfer fittings comprising a first fitting and a second fitting,

said fittings being sealingly connected to said respective boots and conduit and constructed and arranged to provide a passage from the interior of said boot and through said fitting and along a portion of the exterior of said fittings, and said portion adjacent the exterior of said conduit,

a tube encompassing said conduit and at least said portion of said fitting,

said tube providing a sealed chamber forming a passage around said conduit and at least said portion of said fitting,

said chamber being sealingly connected to each respective end of said tube to each respective one of said pair of air transfer fittings, and

said passage and said chamber being sealingly connected and constructed and arranged to provide a continuous passage from the interior of said first boot, through said first fitting and along said portion then through said chamber forming a passage, to said second fitting and along said portion of said second fitting and through said second fitting and then through said interior to said second boot,

each said air transfer fitting being in the shape of a cylinder adapted to be sealed at one end to said first boot and having another end which is tapered and is sealingly connected to said conduit,

a pair of ports in said cylinder, each of said ports extending from the surface of said cylinder and radially inwardly and through said cylinder to an interior channel within said cylinder constructed and arranged to form a passage between the interior of said boot and the exterior of said cylinder,

a pair of slots formed by grooves cut along a portion of the surface of said cylinder,

said slots extending generally axially along said portion of the exterior of said cylinder and disposed about 90° to said radially extending ports,

said slots being constructed and arranged with respect to said ports to form a passage from the interior of said boot to the exterior of said cylinder and axially along said portion of the exterior of said cylinder.

5,009,123

CAMSHAFT

Takeshi Hiraoka, Saitama; Shunsuke Takeguchi, Tochigi, and Satoshi Kawai, Kuki, all of Japan, assignors to Nippon Piston Ring Co. Ltd., Tokyo, Japan

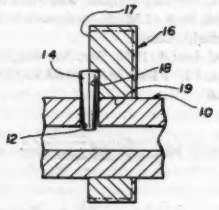
Filed May 4, 1989, Ser. No. 347,224

Claims priority, application Japan, May 23, 1988, 63-66898[U]

The portion of the term of this patent subsequent to Mar. 12, 2008, has been disclaimed.

Int. Cl.[5] F16H *53/00;* B25G *3/28*

U.S. Cl. 74—567 1 Claim



1. A camshaft comprising

a steel shaft,

at least one pin-receiving hole formed in the outer surface of said shaft and perpendicular to the axis of said shaft,

cam pieces made from a sintering alloy material and secured to said shaft by sintering,

a pin-receiving groove formed in the side surface of each of said cam pieces,

a positioning pin having a lower portion inserted into and tightly held by each of said holes and an upper portion fitted in said pin-receiving groove to define the axial and peripheral portions of said cam pieces on said shaft when said cam piece is sintered,

said positioning pin having a tapered configuration and said pin-receiving hole having a straight configuration.

5,009,124

WRIST PIN

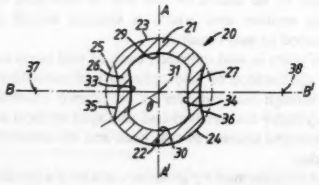
Olivier Beaurepaire, Annecy, France, and Frederick H. Thompson, Bradford, England, assignors to AE PLC, Rugby, England

Continuation of Ser. No. 325,048, Mar. 16, 1989, abandoned, which is a continuation of Ser. No. 9,897, Feb. 2, 1987, abandoned. This application Feb. 27, 1990, Ser. No. 485,885

Claims priority, application United Kingdom, Feb. 13, 1986, 8603582

Int. Cl.[5] F16C *3/04*

U.S. Cl. 74—595 11 Claims



1. A wrist pin comprising an elongate, substantially hollow member having two spaced-apart convex portions each having a substantially cylindrical outer form and which co-operate with corresponding surfaces in wrist pin bosses of an associated piston and in the small end of an associated connecting rod wherein said convex portions are connected by walls of greater radius of curvature than the radius of curvature of said convex portions.

5,009,125

SPEED CONTROL STRUCTURE

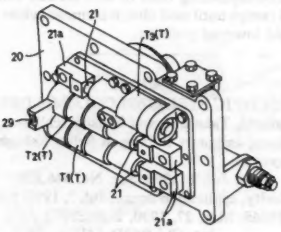
Satoshi Machida, and Akio Hattori, both of Osaka, Japan, assignors to Kubota Ltd., Osaka, Japan

Filed Nov. 1, 1989, Ser. No. 431,019

Claims priority, application Japan, Jan. 26, 1989, 1-19309; Jan. 27, 1989, 1-18293; Feb. 3, 1989, 1-26278

Int. Cl.[5] F16H *57/02, 5/12*

U.S. Cl. 74—606 R 3 Claims



1. A speed control structure comprising;

change speed means including a hydraulic clutch,

a transmission case for housing said change speed means having an opening to expose said hydraulic clutch,

a lid for closing said opening, and

hydraulic control means for controlling said hydraulic clutch, said hydraulic control means including;

hydraulic actuator means for effecting change speed,

a speed control valve for controlling said hydraulic actuator means,

a pilot operated switch valve mounted on an oil line extending to said hydraulic clutch and operatively connected to said hydraulic actuator means for disengaging said hydraulic clutch to start a change speed by said hydraulic actuator means, and engaging said hydraulic clutch upon completion of the change speed, and

a pilot control valve for controlling pilot pressure for the switch valve in response to the operation of said hydraulic actuator means,

wherein said lid carries said hydraulic actuator means mounted on an inside face thereof, said switch valve and said speed control valve mounted on an outside face thereof, and said pilot control valve mounted inside said transmission case.

5,009,126

HYDROSTATIC-MECHANICAL DRIVE SYSTEM

Erwin Meisinger, Hauzenberg, and Jürgen Zimmer, Passau, both of Fed. Rep. of Germany, assignors to Zahnfabrik Friedrichshafen AG, Friedrichshafen, Fed. Rep. of Germany

PCT No. PCT/EP88/00889, § 371 Date Apr. 5, 1990, § 102(e) Date Apr. 5, 1990, PCT Pub. No. WO89/03320, PCT Pub. Date Apr. 20, 1989

PCT Filed Oct. 5, 1988, Ser. No. 469,572

Claims priority, application Fed. Rep. of Germany, Oct. 13, 1987, 3734622

Int. Cl.[5] F16H *47/06*

U.S. Cl. 74—733.1 3 Claims

1. A hydrostatic-mechanical drive system particularly for agricultural and construction vehicles, said system comprising:

an adjustable hydrostatic gearbox including a servohydraulic pump, said gearbox employing for control a hydraulic pressure medium operating in a hydrostatic cycle, said cycle including a high-pressure segment;

a mechanical two step gearbox subsequently serially connected to said adjustable hydrostatic gearbox, comprising:

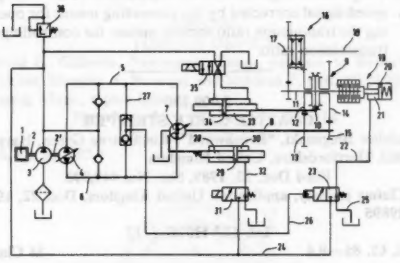
a driven shaft; and

a mechanical parking brake acting directly upon said driven shaft, said brake including a cylinder;

a pressure duct leading away from said adjustable hydrostatic gearbox;

a 3/2-way valve communicating with said pressure duct and said cylinder;

a pressure-free return duct communicating with said 3/2-way valve and said pressure duct; and



wherein said parking brake is actuated by a branching off of said pressure medium from said high-pressure segment of said hydrostatic cycle through said pressure duct to switch said 3/2-way valve either causing actuation of said cylinder of said parking brake with pressure from said servohydraulic pump or causing connection of said parking brake with said pressure-free return valve.

5,009,127

TRANSMISSION RATIO CONTROL SYSTEM FOR A CONTINUOUSLY VARIABLE TRANSMISSION

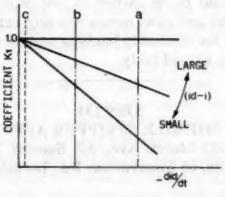
Yoshihiko Morimoto, Mitaka, and Tetsushi Kohno, Musashino, both of Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 6, 1989, Ser. No. 418,188

Claims priority, application Japan, Oct. 14, 1988, 63-260185

Int. Cl.[5] B60K *41/14*

U.S. Cl. 74—866 **3 Claims**



1. A control system for a continuously variable transmission for transmitting power of an engine mounted on a motor vehicle, the engine having a throttle valve, the transmission comprising a drive pulley having a hydraulically shiftable disc and a hydraulic cylinder for operating the disc, a driven pulley having a hydraulically shiftable disc and a hydraulic cylinder for operating the disc of the driven pulley, a belt engaged with both pulleys, the control system comprising a first hydraulic circuit having a pump for supplying oil to both the hydraulic cylinders, a transmission ratio control valve for controlling the oil supplied to the cylinder of the drive pulley to change the transmission ratio of the transmission to a desired transmission ratio, the system comprising:

transmission ratio control means for operating the transmission ratio control valve;

a drive pulley speed sensor for producing a drive pulley speed signal;

a driven pulley speed sensor for producing a driven pulley speed signal;

a throttle position sensor for sensing an opening degree of the throttle valve and for producing a throttle opening degree signal;

first calculator means responsive to the drive pulley speed signal and the driven pulley speed signal for producing an actual transmission ratio signal;

means responsive to the throttle opening degree signal and to the actual transmission ratio signal for producing a desired transmission ratio signal;

second calculator means responsive to the desired transmission ratio signal for producing a desired transmission ratio changing speed signal;

third calculator means responsive to the actual transmission ratio signal and the desired transmission ratio signal for calculating a difference between both the ratio signals and for producing a ratio difference signal;

coefficient setting means responsive to the desired transmission ratio changing speed signal and to the ratio difference signal for producing a correcting coefficient;

correcting means responsive to said actual and desired transmission ratio signals for producing an actual transmission ratio changing speed signal using the correcting coefficient; and

driving means responsive to the actual transmission ratio changing speed signal for operating the transmission ratio control means for controlling the transmission ratio.

5,009,128

INDICATING SYSTEM FOR AN AUTOMATIC MOTOR VEHICLE TRANSMISSION

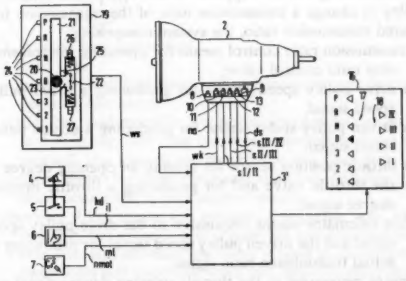
Willi Seidel, Eberdingen-Hochdorf; Roland Ehniss, Pforheim; Klaus Skabrond, Leonberg-Warmbronn; Ulrich Sauter, Tiefenbronn; Ulrich Maier, Freiberg, and Roland Ebner, Villingen-Schwewnningen, all of Fed. Rep. of Germany, assignors to Dr. Ing. h.c.F. Porsche AG, Fed. Rep. of Germany

Filed Sep. 28, 1989, Ser. No. 413,757

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1988, 3832971

Int. Cl.[5] F16H *59/00*; B60K *20/02*

U.S. Cl. 74—866 **15 Claims**



1. An indicating system of an electronically or electrohydraulically controlled motor vehicle multi-speed transmission, said transmission having a selector lever for the preselection of a driving position in which are engaged individual or several automatically shiftable driving gears in a fully automatic operating mode and a semi-automatic operating mode in which the driving gear may be selected manually, said indicating system including:

first displaying means for displaying the preselected driving position corresponding to the selector lever position by means of first indicating elements marked by alphanumerical symbols, and

second displaying means for displaying an indication of a driving gear that is currently engaged, said second displaying means including second indicating elements

which are viewable separately from and simultaneously with the first indicating elements;

wherein the first and second indicating elements are spaced from one another; and

wherein the second indicating elements are controlled only during the semi-automatic operating mode with a manual selection of the driving gears.

5,009,129

TRANSMISSION RATIO CONTROL SYSTEM FOR A CONTINUOUSLY VARIABLE TRANSMISSION

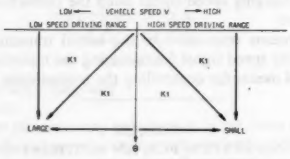
Yoshihiko Morimoto, Mitaka, and Tetsushi Kohno, Musashino, both of Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 6, 1989, Ser. No. 418,187

Claims priority, application Japan, Oct. 14, 1988, 63-260183; Oct. 14, 1988, 63-260184

Int. Cl.[5] B60K *41/14*

U.S. Cl. 74—866 **4 Claims**



1. A control system for a continuously variable transmission for transmitting power of an engine mounted on a motor vehicle, the engine having a throttle valve, the transmission comprising a drive pulley having a hydraulically shiftable drive disc and a hydraulic cylinder for operating the drive disc, a driven pulley having a hydraulically shiftable driven disc and a hydraulic cylinder for operating the driven disc, a belt engaged with both of said pulleys, the control system comprising a first hydraulic circuit having a pump for supplying oil to both of the hydraulic cylinders, a transmission ratio control valve for controlling the oil supplied to the cylinder of the drive pulley to change a transmission ratio of the transmission to a desired transmission ratio, the system comprising:

transmission ratio control means for operating the transmission ratio control valve;

a drive pulley speed sensor for producing a drive pulley speed signal;

a driven pulley speed sensor for producing a driven pulley speed signal;

a throttle position sensor for sensing an opening degree of the throttle valve and for producing a throttle opening degree signal;

first calculator means responsive to the drive pulley speed signal and the driven pulley speed signal for producing an actual transmission ratio signal;

means responsive to the throttle opening degree signal and to the actual transmission ratio signal for producing a desired transmission ratio signal;

second calculator means responsive to the desired transmission ratio signal and to the actual transmission ratio signal for producing a transmission ratio changing speed signal;

third calculator means responsive to the throttle opening degree signal for producing a throttle opening degree changing speed signal;

coefficient setting means responsive to the driven pulley speed signal as a vehicle speed signal and to the throttle opening degree changing speed signal for producing a correcting coefficient, wherein the correcting coefficient represents an increasing function of the throttle opening degree changing speed signal and a decreasing function of the driven pulley speed signal as said vehicle speed signal in a low vehicle speed range lower than a predetermined vehicle speed;

said second calculator means comprising correcting means for correcting the transmission ratio changing speed signal with the correcting coefficient so as to provide a higher transmission ratio changing speed in a low vehicle speed range; and

driving means responsive to the transmission ratio changing speed signal corrected by the correcting means for operating the tranmission ratio control means, for controlling the transmission ratio.

5,009,130

COAXIAL CABLE STRIPPER

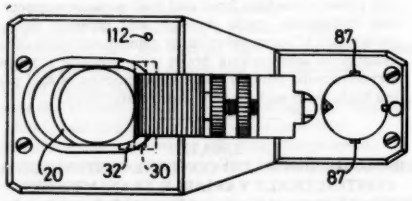
Zdzislaw Bieganski, "Brushwood", Kinsbourne Green, Harpenden, Hertfordshire, United Kingdom

Filed Dec. 13, 1989, Ser. No. 449,993

Claims priority, application United Kingdom, Dec. 22, 1988, 8829895

Int. Cl.[5] H02G *1/12*

U.S. Cl. 81—9.4 **14 Claims**



1. A tool for stripping a coaxial cable comprising a body having an opening therein; a blade carrier accommodated in said opening for sliding movements along a path relative to said body; a plurality of spaced apart, parallel blades supported by said blade carrier and projecting different distances beyond said carrier; means for supporting a coaxial cable in said body transverse to the path of sliding movement of said blade carrier and in a position to be engaged by said blades in response to movement of said blade carrier in one direction along said path; and ratchet and pawl means reacting between said body and said carrier for releasably latching said carrier in a selected position relative to said body.

5,009,131

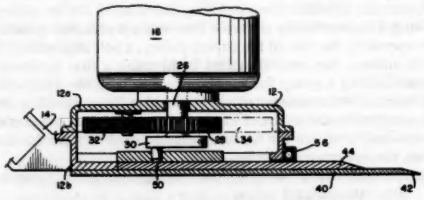
ROOF SHINGLE STRIPPER APPARATUS

Brian J. Alto, 382 Morris Ave., A3, Summit, N.J. 07901, and Gregory F. Alto, 68 Runnymeade Rd., Berkeley Heights, N.J. 07922

Filed May 4, 1990, Ser. No. 519,406

Int. Cl.[5] E04D *15/00*

U.S. Cl. 81—45 **9 Claims**



1. Roof shingle stripper apparatus, comprising:

a housing having a longitudinal axis;

nail-cutting means slidably mounted in said housing for movement, relative to said housing, perpendicular to said axis; and

a prime mover, mounted to said housing and coupled to said means for moving said means in such perpendicular movement; further including

means immovably fastened to said housing for lifting portions of shingles; wherein

said nail-cutting means is slidably disposed upon said lifting means.

5,009,132

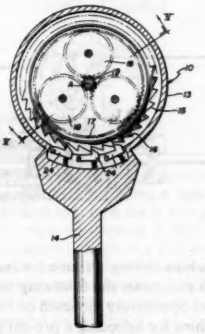
TORQUE DEVICE

Daniel G. Gilberto, Newington, Conn., assignor to Robert A. Grant; Douglas A. Bourque and Mildred T. Felt, all of Fitchburg, Mass., a part interest

Filed May 31, 1990, Ser. No. 531,114

Int. Cl.[5] B25B *17/00*

U.S. Cl. 81—57.3 **10 Claims**



1. Torque device, comprising:

(a) first and second outer housings located in spaced relationship,

(b) a third intermediate housing lying between and joining the first and second housings, the intermediate housing having means for rotating it about a main axis,

(c) a ring lying within the intermediate housing and rotatable therein about the said main axis, the ring being formed with ratchet teeth on its outer periphery and with gear teeth on its inner periphery,

(d) a cluster of planetary gears carried within the ring and engaging the gear teeth of the ring, and

(e) a sun gear located within the cluster for rotation about the main axis and extending axially into engagement with both the first and second housings,

wherein each of the first and second outer housings has an output element centered on the main axis and extending axially in the direction away from the intermediate housing.

5,009,133

SURFACE PROTECTIVE FASTENER TOOL

David R. Carey, 17052 - 4th NE., Seattle, Wash. 98155

Continuation-in-part of Ser. No. 219,088, Jul. 14, 1988, abandoned. This application Jun. 7, 1989, Ser. No. 362,760

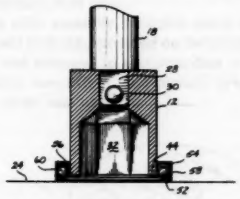
Int. Cl.[5] B25B *13/58*

U.S. Cl. 81—180.1 **48 Claims**

1. Apparatus for protecting an underlying surface from abrasion by contact with a tool used to rotate a threaded fastener, comprising:

a sleeve having a resilient cushion disposed at one end, said sleeve being sized to fit over the tool so that the resilient cushion is proximate a portion of the tool that is used to engage the threaded fastener and extends beyond a distal end of said tool, preventing it from contacting the underlying surface;

means for retaining the sleeve on the tool, including bearing means for supporting the tool to prevent it contacting the underlying surface and permitting the sleeve to remain stationary against the underlying surface as an operator turns the tool within the sleeve to rotate the threaded



fastener, said resilient cushion carrying any force directed through the tool against the underlying surface during use of the tool, so that the underlying surface is protected from abrasion that would otherwise occur due to the tool contacting said surface.

5,009,134

QUICK-ACTION BAR CLAMP

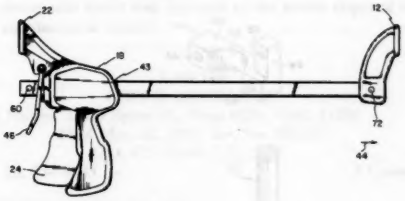
Joseph A. Sorensen, and Dwight L. Gatzemeyer, both of Lincoln, Nebr., assignors to Petersen Manufacturing Co., Inc.

Continuation-in-part of Ser. No. 234,173, Aug. 19, 1988, Pat. No. 4,926,722. This application Feb. 15, 1990, Ser. No. 480,283

The portion of the term of this patent subsequent to May 22, 2007, has been disclaimed.

Int. Cl.[5] B25B *5/02*

U.S. Cl. 81—487 **8 Claims**



1. A hand tool comprising

a fixed jaw;

a movable jaw, said fixed jaw and movable jaw facing in opposite directions;

a slide bar, said movable jaw being mounted on one end of said slide bar, said slide bar being movable to bring said movable jaw toward and away from said fixed jaw;

support means for supporting said slide bar, said fixed jaw being connected to said support means;

one-way drive means for releasably engaging and, when engaged, for advancing said slide bar and attached movable jaw, said movable jaw being subject to advancement away from said fixed jaw when said one-way drive means is disengaged;

said one-way drive means having a driving lever, and a braking lever normally engaging said slide rod, said braking lever when engaging said slide bar preventing motion of said movable jaw toward said fixed jaw, said braking lever having an engaging portion extending outwardly from said support means,

a trigger handle pivotably mounted to said support means rearwardly of said breaking lever and contacting said driving lever,

said engaged driving lever moving said slide rod and said movable jaw away from said fixed jaw, said support means including a handgrip, a trigger-type relationship existing between said trigger handle and said handgrip, said bar clamp being holdable at said handgrip, said braking lever and the trigger handle being selectively operable

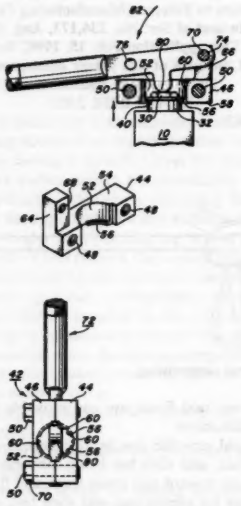
by the same hand in such a manner that one of the index and middle fingers is positioned on the engaging portion of the braking lever to actuate the braking lever, while the other fingers encircle and contain the trigger handle and the handgrip.

5,009,135

BRAKE ADJUSTMENT TOOL

Lawrence J. Arnold, Eagle Harbor, N.Y., assignor to Edward Arnold, Hilton, N.Y.

Filed Sep. 26, 1989, Ser. No. 412,515
Int. Cl.[5] B25B 9/00
U.S. Cl. 81—488 26 Claims



1. A tool for restoring retracted locking collars for brake adjusting screws to their original positions comprising:

an adjustable clamp having jaw portions for gripping a peripheral surface of the locking collar;

each jaw portion forming a load bearing surface against an end rim of the locking collar;

means for adjusting spacing between said jaw portions for releasably securing said adjustable clamp to the locking collar;

a pivot support mounted on a top surface of said adjustable clamp defining a pivot axis;

a lever arm mounted about said pivot axis having a handle formed at one end and a cam extension located along said lever arm in a position that may be pivoted into contact with a head portion of the adjusting screw; and

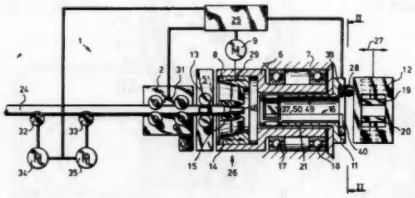
said load bearing surfaces being defined by projecting edges formed adjacent to a bottom surface of said adjustable clamp.

5,009,136

TURNING MACHINE

Reiner Glomb, Velbert; Peter Maresch, and Ralf Wagner, both of Solingen, all of Fed. Rep. of Germany, assignors to Th. Kieserling & Albrecht GmbH & Co., Werkzeugmaschinenfabrik, Solingen, Fed. Rep. of Germany

Filed Dec. 8, 1989, Ser. No. 447,742
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1988, 3843257
Int. Cl.[5] B23B 5/12
U.S. Cl. 82—127 3 Claims



1. Turning machine having a frame for turning rods, pipes, or the like which comprises the following features:

(a) infeed means operatively mounted on the inlet side of the turning machine for infeeding a pre-cut rod into said inlet side;

(b) rotating cutter-head means operatively mounted in said turning machine downstream from said infeed means for turning off a peripheral layer of said rod;

(c) said rotating cutter-head means being mounted adjacent to the upstream end of a hollow shaft which is rotatably coaxially mounted in the frame of said machine;

(d) a rear guide mechanism for approximately centering the rods, pipes or the like operatively coaxially mounted in said machine downstream of said cutter-head means;

(e) the rear guide mechanism is operatively mounted on said machine frame and extends axially into said hollow shaft adjacent to said cutter-head means;

(f) withdrawal means for withdrawing the finished turned workpiece from said turning machine mounted downstream from said rear guide mechanism;

(g) said rear guide mechanism includes a plurality of individually spring biased guide elements operatively mounted therein which abut against said rod;

(h) said rear guide mechanism includes central adjustment means operatively mounted in said machine for simultaneously adjusting all of said guide elements;

(i) said central adjustment means includes spring biasing means whereby said spring biasing means selectively actuates said central adjustment means to simultaneously adjust all guide elements;

(j) for each of said individual guide elements there are arranged two stops on said adjusting means;

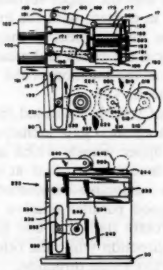
(k) a first stop of said two stops is rigidly mounted on said adjusting means, whereas the second stop of said two stops is spring biasedly mounted on said adjusting means whereby said rear guide mechanism may adjust to affect appropriate centering of the rod being turned;

(l) the first rigid stop limits the spring deflection movement of each individual guide element which coacts with the second stop.

5,009,137
CUTTER MODULE FOR A MODULAR MAILING MACHINE

Hugh S. Dannatt, Bethel, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Continuation of Ser. No. 135,107, Dec. 18, 1987, abandoned. This application Jan. 8, 1990, Ser. No. 463,882
The portion of the term of this patent subsequent to Dec. 12, 2006, has been disclaimed.
Int. Cl.[5] B26D *5/22*
U.S. Cl. 83—209 **3 Claims**



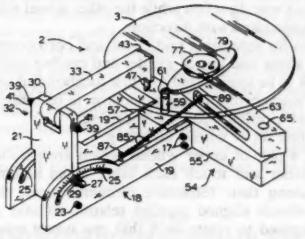
1. A combination comprising:
a mailing machine having a base and support walls extending therefrom; a tape module including a tape track, support means for supporting said tape track in a generally cantilevered manner, tape positioning means for selectively positioning said support means in a first position and in a second position laterally displaced from said first position, said tape positioning means having a track formed along one of said mailing machine support walls,
a rail slidable mounted on said track,
a first bracket fixably mounted to said rail, said support means being pivotally mounted to said first bracket,
a second bracket fixably mounted to said rail, said second bracket having an elongated slot formed therein
a motor fixably mounted to said base of said mailing machine,
a crank rotatably mounted in said mailing machine and having a pin slidably mounted in said slot of said second bracket such that rotation of said crank causes said second bracket to displace said rail along said track,
means communicating said motor to said crank such that actuation of said motor causes rotation of said crank,
tape feed means for selectively feeding imprinting tape to and through said tape track; and,
a cutter module having a cutter support member slidably mounted to one of a mailing machine support walls such that said cutter support member can be slidably displaced laterally with respect to said tape track, a rotary cutter blade rotatably mounted to said cutter support member, said means for communicating further having means for reciprocally displacing said cutter support member traverse to said tape track of said tape module, and means for providing a cutting surface coactive with said rotary cutter blade.

5,009,138
ROTARY CUTTER DEVICE

C. William Rettie, 306 Hickory Dr., Chapel Hill, N.C. 27514

Filed Apr. 6, 1990, Ser. No. 505,725
Int. Cl.[5] B27C *5/02*
U.S. Cl. 83—413 **17 Claims**

1. A rotary cutter apparatus, comprising:
(a) a base;
(b) an articulated cutter arm assembly, comprising:
(i) a main cutter arm; and
(ii) a support arm having first and second ends, with the first end being coupled to the base so as to allow pivotal movement of the first end, and with the second end being coupled to the main cutter arm so as to be pivotally movable with respect thereto, such that the main cutter arm is translatable along a longitudinal direction;
(c) an elongate swing arm having first and second ends, and coupled at its first end to the base so as to be pivotally swingable about a first axis;
(d) a rotatable table assembly, rotatable about a second axis parallel to said first axis, mounted on the second end of the swing arm and arranged to accommodate rotation of the table assembly concurrent with pivotal swinging of said swing arm about said first axis;

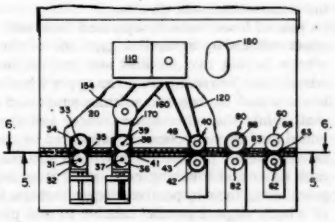


(e) a template cam coupleable to said table assembly and rotatable therewith about said second axis;
(f) a bearing member attached to said base; and
(g) biasing means interconnecting (i) a portion of the swing arm other than its first end, and (ii) the base, for maintaining said template cam in contact with the bearing member during rotation of said rotatable table assembly about said second axis, concurrently with pivotable swinging of said swing arm about said first axis to the extent required to maintain said contact.

5,009,139
CHECK DESTRIPPER

Yosi Nissim, 23509 Spires St., West Hills, Calif. 91304

Filed Mar. 31, 1989, Ser. No. 332,525
Int. Cl.[5] B26D *1/22, 5/22*
U.S. Cl. 83—419 **3 Claims**



1. An apparatus for separating a check which has attached to it a corroborating paper strip in a manner such that the corroborating paper strip is aligned along the bottom edge of the check and the two are attached together by means which creates a line of joinder between the lower edge of the check and the upper edge of the corroborating paper strip, comprising:
a. an opening in said apparatus through which said check and attached corroborating paper strip is inserted;
b. a horizontally aligned plate;
c. means for orienting the check and attached corroborating paper strip such that the bottom edge of the corroborating paper strip is adjacent said plate, and the check and corroborating paper strip are approximately perpendicular to said plate, further comprising,

(i) a first pair of wheels which are parallel to each other and touch each other at an adjoining point along their respective circumferences, the pair of wheels aligned at an angle relative to said plate, and caused to rotate such that one wheel rotates in the clockwise direction while the other wheel rotates in the counterclockwise direction,

(ii) a second pair of wheels which are parallel to each other and touch each other at an adjoining point along their respective circumferences, the pair of wheels aligned at an angle relative to said plate and separated from said first set of wheels by a horizontal gap, and caused to rotate such that one wheel rotates in the clockwise direction while the other wheel rotates in the counterclockwise direction;

d. means for separating said check and corroborating paper strip along said line of joinder and causing said separated check to be transported to a first location and causing said separated corroborating paper strip to be transported to a second location, further comprising,

(i) a first set of wheels including,

(a) a pair of upper wheels which are parallel to each other and touch each other at an adjoining point along their respective circumferences, the pair of wheels aligned parallel relative to said plate, and caused to rotate such that one wheel rotates in the clockwise direction while the other wheel rotates in the counterclockwise direction,

(b) a pair of lower wheels separated from said pair of upper wheels by a vertical gap, with a respective one wheel from said pair of upper wheels and one wheel from said pair of lower wheels being supported on the same shaft, the pair of lower wheels which also parallel to each other and touching each other at an adjoining point along their respective circumferences, the pair of wheels aligned parallel relative to said plate, and caused to rotate such that one wheel rotates in the clockwise direction while the other wheel rotates in the counterclockwise direction,

(ii) a second set of wheels separated from said first set of wheels by a horizontal gap, including,

(a) a pair of upper wheels which are parallel to each other and touch each other at an adjoining point along their respective circumferences, the pair of wheels aligned parallel relative to said plate, and caused to rotate such that one wheel rotates in the clockwise direction while the other wheel rotates in the counterclockwise direction,

(b) a pair of lower wheels separated from said pair of upper wheels by a vertical gap, one of the lower wheels having two sections and one of the lower wheels have one section, with an upper wheel and the lower wheel having two sections supported on one shaft while the other upper wheel and the lower wheel having one section are supported on two separate shafts, the pair of lower wheels also parallel to each other and touching each other at an adjoining point along their respective circumferences, the pair of wheels aligned parallel relative to said plate, and caused to rotate such that one wheel rotates in the clockwise direction while the other wheel rotates in the counterclockwise direction,

(c) the lower wheel having two sections including an upper section of smaller diameter than the lower section aligned relative to the other lower wheel having one section such that the upper surface of the lower section of the two section wheel comes in contact with the lower circumference of the other lower wheel having one section to thereby create a knife which can cut the check and attached corroborating paper strip at the location of the point of touching of the two wheels;

(b) a pair of lower wheels separated from said pair of upper wheels by a vertical gap, with a respective one wheel from said pair of upper wheels and one wheel from said pair of lower wheels being supported on the same shaft, the pair of lower wheels also parallel to each other and touching each other at an adjoining point along their respective circumferences, the pair of wheels aligned parallel relative to said plate, and caused to rotate such that one wheel rotates in the clockwise direction while the other wheel rotates in the counterclockwise direction,

(c) one of said pair of lower wheels having two sections, with an upper section of smaller diameter than the lower section and aligned relative to the other lower wheel such that the upper surface of the lower section comes in contact with the lower circumference of the other lower wheel to thereby create a knife which can cut the check and attached corroborating paper strip at the location of the point of joinder of the two wheels;

(iii) a third set of wheels separated from said first set of wheels by a horizontal gap, including,

(a) a pair of upper wheels which are parallel to each other and touch each other at an adjoining point along their respective circumferences, the pair of wheels aligned parallel relative to said plate, and caused to rotate such that one wheel rotates in the clockwise direction while the other wheel rotates in the counterclockwise direction,

(b) a pair of lower wheels separated from said pair of upper wheels by a vertical gap, with a respective one wheel from said pair of upper wheels and one wheel from said pair of lower wheels being supported on the same shaft, the pair of lower wheels also parallel to each other and touching each other at an adjoining point along their respective circumferences, the pair of wheels aligned parallel relative to said plate, and caused to rotate such that one wheel rotates in the clockwise direction while the other wheel rotates in the counterclockwise direction; and

d. the three sets of wheels in means for separating said check and corroborating paper strip aligned relative to said first and second pair of wheels of said means for orienting said check and attached paper strip such that each of the upper pair of wheels comes in contact with said check along the point of touching between each pair of upper wheels and each of the lower pair of wheels comes in contact with said corroborating paper strip along the point of touching between each pair of lower wheels;

e. whereby when said combination check and attached corroborating paper strip is inserted into said apparatus through said opening, said first pair of wheels pulls said check and attached corroborating paper strip into said apparatus by causing said check and attached corroborating paper strip to be guided between said first pair of wheels along their point of joinder and pulled toward said plate with the leading edge of said corroborating paper strip being pulled toward said plate and said second pair of wheels continues the process of pulling said check and attached corroborating paper strip toward said plate to orient the lower edge of the attached paper strip along the surface of said plate and cause said check and attached paper strip to be aligned perpendicular to said plate, and when said check and attached corroborating paper strip leaves the second pair wheels of said means for orienting the check and attached corroborating paper strip, said first set of wheels pulls the check and attached corroborating paper strip horizontally between the pair of wheels and guides, it to the second pair of wheels, the upper pair of wheels of the second pair of wheels pulls the check and corroborating paper strip such that the lower pair wheels cuts the check and corroborating paper strip along their line of joinder, and the separated check and corroborating paper strip are guided to the third pair of wheels wherein the upper pair of wheels causes the separated check to be guided to one location outside the apparatus while the

lower pair of wheels causes the separated corroborating paper strip to be guided to a second location outside the apparatus.

5,009,140

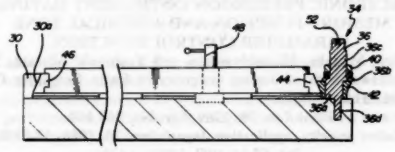
CLAMPING APPARATUS FOR CUT-OFF DIE SET

John H. Nolan, Mt. Clemens, and Dennis H. Skvarce, Wixom, both of Mich., assignors to Alpha Industries, Inc., Novi, Mich.

Continuation-in-part of Ser. No. 417,033, Oct. 14, 1989, abandoned. This application Dec. 12, 1989, Ser. No. 449,594

Int. Cl.[5] B26D *1/60*; B23D *21/00*

U.S. Cl. 83—698 15 Claims



7. A clamping apparatus for securing die components to the carriage of a cut-off press comprising:

a platen having two outwardly beveled opposite edges;

die components secured to the platen;

stop means fixed to said carriage having an inwardly beveled edge to coact with one of the outwardly beveled edges of the platen; and

rotatable eccentric clamping means, including a bracket mounted to the carriage and an axial member, having an inwardly beveled eccentric portion, journaled at one end in the carriage and journaled at the opposite end in the bracket, located on the carriage to coact with the outwardly beveled edge opposite the stop means to wedge said platen between the stop means and the eccentric clamping means.

5,009,141

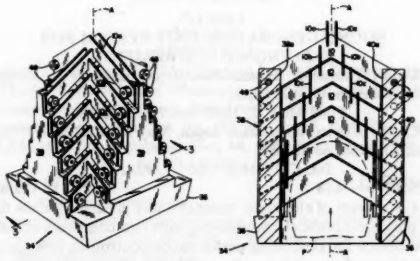
BLADE ASSEMBLY FOR SLICING FOOD PRODUCTS

John C. Julian, Tualatin, and David S. Phelps, Tigard, both of Oreg., assignors to Lamb-Weston, Inc., Tri-Cities, Wash.

Filed Sep. 23, 1985, Ser. No. 779,209

Int. Cl.[5] B26D *1/02*

U.S. Cl. 83—857 11 Claims



1. A food slicing apparatus for slicing vegetables into strips, comprising:

a first set of cutting elements, each having a first edge of chevron configuration and an apex, and a second sharpened edge of chevron configuration opposite said first edge;

a second set of cutting elements, each having a first edge of chevron configuration and an apex, and a second sharpened edge of chevron configuration opposite said first edge of said second set for slicing vegetables;

the cutting elements each having two angled blade segments with knife edges thereon meeting at a downstream knife edge convergence;

cutting element mounting means for mounting said first and second set of cutting elements in a substantially pyramidal configuration such that (1) said cutting elements of said first set are substantially parallel to one another, and (2) said cutting elements of said second set are substantially parallel to one another and substantially perpendicular to said first set of cutting elements, the pyramidal configuration having an apex at a downstream end thereof;

said cutting element mounting means further mounting both said cutting elements of said first and second sets in axially staggered, transversely spaced pairs such that each successive downstream pair of cutting elements is disposed incrementally closer to the axial centerline of the apparatus.

5,009,142

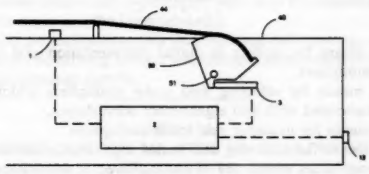
MEANS AND METHOD FOR AUTOMATIC RESONANCE TUNING

Noel T. Kurtz, 186 Besemer Hill Rd., Ithaca, N.Y. 14850

Filed Mar. 26, 1990, Ser. No. 498,728

Int. Cl.[5] G10G *7/02*

U.S. Cl. 84—454 18 Claims



1. An apparatus for adjustment of resonance frequency of a filament, comprising:

(a) a piezoelectric actuator that changes in length as an electric field is applied thereto and is connected to said filament either directly or through means for amplifying the movement of said piezoelectric actuator such that a change in the length of said piezoelectric actuator changes the tension of said filament,

(b) means for measuring frequency of said filament,

(c) means for controlling resonance frequency adjustment connected to said means for measuring resonance frequency and said piezoelectric actuator such that said means for controlling frequency adjustment adjusts the resonance frequency of said filament by varying said electric field applied to said piezoelectric actuator.

5,009,143

EIGENVECTOR SYNTHESIZER

John V. Knopp, 10407 SE. 174th Apt. 1207, Renton, Wash. 98055

Continuation of Ser. No. 42,109, Apr. 22, 1987, abandoned. This application Dec. 26, 1989, Ser. No. 456,063

Int. Cl.[5] G10H *1/08, 7/02*

U.S. Cl. 84—604 11 Claims

1. An eigenvector synthesizer comprising:

(a) means for storing in digital representation multiple eigenvector waveshape sets in which each eigenvector waveshape set has been calculated from a covariance matrix which specifies the interaction among related waveshapes of musical instruments and/or sounds,

(b) means for selecting said eigenvector waveshape sets and

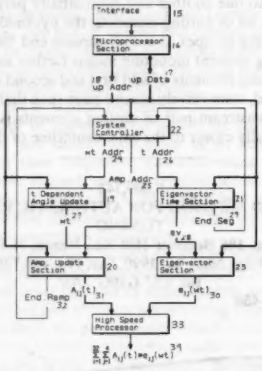
eigenvector waveshapes having a time dependent angle within one of said eigenvector waveshape sets,

(c) means for addressing a position on said eigenvector waveshapes with said time dependent angle and thereby obtaining eigenvector waveshape amplitudes,

(d) means for storing in digital representation said time dependent angle,

(e) means for updating said time dependent angle,

(f) means for scaling said eigenvector waveshape amplitudes by multiplying said eigenvector waveshape amplitudes by scalar multipliers and thereby obtaining scaled eigenvector waveshape amplitudes,



(g) means for storing in digital representation said scalar multipliers,

(h) means for selecting said scalar multipliers which are associated with said eigenvector waveshapes,

(i) means for updating said scalar multipliers,

(j) means for summing said scaled eigenvector waveshape amplitudes within one of said eigenvector waveshape sets and thereby producing a signal which can be used to generate a musical sound and,

(k) means for summing said signal with another signal and thereby producing a complex signal which can be used to generate multiple musical sounds.

5,009,145

AUTOMATIC PERFORMANCE APPARATUS HAVING AUTOMATIC SYNCHRONIZING FUNCTION

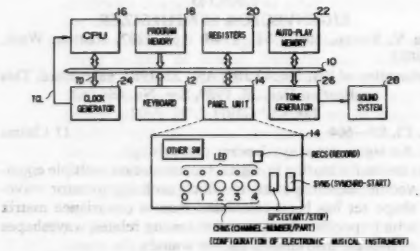
Takashi Ishida, and Masao Kondo, both of Hamamatsu, Japan, assignors to Yamaha Corporation, Hamamatsu, Japan

Filed Mar. 8, 1989, Ser. No. 321,228

Claims priority, application Japan, Mar. 8, 1988, 63-54556

Int. Cl.[5] G10H *1/38, 1/40, 7/00*

U.S. Cl. 84—612 **5 Claims**



5. An automatic performance apparatus comprising:

(a) memory means for storing performance information indicative of plural parts to be performed in parallel;

(b) designating means for designating one of said plural parts to be performed;

(c) timing adjusting means for adjusting a performance start timing of a first part to a bar corresponding to the timing of a second part within said plural parts; and

(d) tone generation means for simultaneously generating tones of said first part with tones of said second part in an overlapping manner under control of said timing adjusting means.

5,009,146

ELECTRONIC PERCUSSION INSTRUMENT HAVING A MEMORY FUNCTION AND A MUSICAL TONE PARAMETER CONTROL FUNCTION

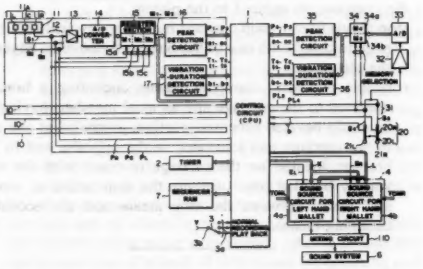
Hajime Manabe, Higashiyamato, and Yoshiyuki Murata, Tachikawa, both of Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

Filed Jun. 19, 1989, Ser. No. 368,249

Claims priority, application Japan, Jun. 23, 1988, 63-83265

Int. Cl.[5] G10H *1/053, 1/18*

U.S. Cl. 84—615 **34 Claims**



24. An electronic percussion instrument, comprising:

at least one striking member which can be used for a striking operation;

striking-state detection means provided on said striking member, for detecting a state of the striking operation of the striking member;

striking-data generating means for sequentially generating striking data corresponding to the states of striking operation detected by said striking-state detection means, every time the striking operation by said striking member is executed; and

memory means for sequentially storing the striking data generated by said striking-data generation means.

5,009,147

SOUND GENERATING UNIT SYSTEM FOR ELECTRONIC INSTRUMENTS

Takenori Yamamori, Hamamatsu, Japan, assignor to Roland Corporation, Osaka, Japan

Filed May 23, 1989, Ser. No. 356,308

Claims priority, application Japan, May 25, 1988, 63-127486; Jun. 23, 1988, 63-153652

Int. Cl.[5] G10H *1/057, 1/42, 1/46*

U.S. Cl. 84—618 **19 Claims**

1. A system of electronic musical sound generating units for an electronic musical instrument system that comprises at least one device for generating performance controlling messages,

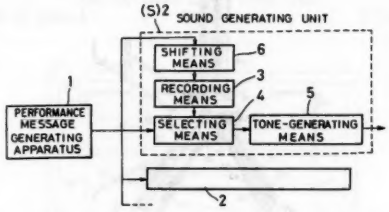
said sound generating units each being responsive to performance controlling messages received from the performance message generating device, and

each of said sound generating units comprising

recording means for recording preferential orders that deter-

mine a sequential order by which each sound generating unit receives performance controlling messages;

selecting means for selecting performance controlling messages to be received by said sound generating unit in



accordance with preferential orders recorded by the recording means; and

tone-generating means for generating musical tones based on performance controlling messages that have been selected by the selecting means.

5,009,148

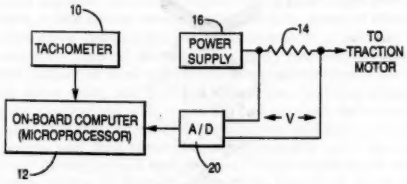
VEHICLE AIR EXCHANGE ACCORDING TO PASSENGER LOAD

Kenneth A. Karg; Carl K. Hvozda; Robert N. Neddermeyer, and Alexander Feld, all of Pittsburgh, Pa., assignors to AEG Westinghouse Transportation Systems, Inc., Pittsburgh, Pa.

Filed Dec. 1, 1989, Ser. No. 444,787

Int. Cl.[5] B61D *27/00*

U.S. Cl. 98—10 **10 Claims**



1. In a ventilation system for a vehicle powered by an electric motor, the improvement comprising:

means for detecting the velocity of the vehicle;

means for detecting the current of the electric motor supplying power to the vehicle;

at least one variable speed fan; and

means connected to the variable speed fan for controlling the speed of the fan in proportion to the electric motor current detected when the velocity of the vehicle reaches a preselected range.

5,009,149

ROOF VENT

Richard J. MacLeod, Milford; Norman L. Chubb, Dearborn, and Charles E. Schiedegger, Metamora, all of Mich., assignors to Tapco Products Company, Inc., Detroit, Mich.

Continuation-in-part of Ser. No. 293,946, Jan. 5, 1989, Pat. No. 4,924,761. This application Dec. 18, 1989, Ser. No. 452,239

Int. Cl.[5] F24F *7/02*

U.S. Cl. 98—42.21 **11 Claims**

1. A roof vent comprising

a one-piece plastic body including a base wall having transversely spaced sets of rows of integral vanes extending from one surface thereof,

each vane having a free end adapted to engage the roof when the vent is in position on a roof,

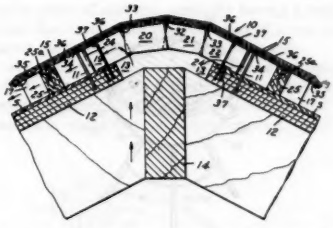
the vanes in each row of vanes of each set of vanes being longitudinally spaced from one another, parallel to one another, and extending at an acute angle to the axis of the wall and the vanes of the other row of each set of rows being longitudinally spaced from one another, parallel to one another and extending at an oppositely directed acute angle to the longitudinal axis of the wall,

each outermost row of vanes being arranged such that the general plane of each vane intersects the general plane of an adjacent vane of an inner row,

each vane having an outer free edge and an inner free edge,

each vane having the inner free end thereof generally curved such that the free edge of said free end extends outwardly,

a layer of porous material positioned between adjacent rows of vanes,



said layer having a height greater than the height of the vanes such that when the vent is positioned with the vanes engaging the roof and the base wall spaced from the roof, air is vented through sinuous paths defined by successive rows of vanes outwardly and water and snow are prevented from entry beneath the vent into the building by the vanes and the layer, and

tubular projections on each vane forming nail openings, said projections being formed with integral membranes closing the openings therein.

5,009,150

DEVICE FOR THE HEATING OR COOLING OF FOOD-STUFFS

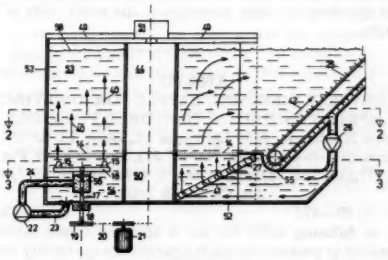
Niels J. Andersen, Broby, Denmark, assignor to Cabinnovent ApS, Harby, Denmark

Filed Jan. 30, 1989, Ser. No. 303,858

Claims priority, application Denmark, Feb. 17, 1988, 825/88

Int. Cl.[5] A23L *3/00, 3/04, 3/18;* A47J *27/122*

U.S. Cl. 99—360 **12 Claims**



1. Apparatus for treatment of softly packaged food-stuff objects by immersion of said objects into a body of liquid, said apparatus comprising a vessel, said vessel comprising an essentially horizontal bottom wall and at least one essentially vertical side wall, said bottom wall and said at least one side wall being essentially fluid-tight and being joined in an essentially fluid-tight fashion in order that said vessel is adapted to hold a body of liquid, a floor for supporting said objects within said body of liquid at a level above said bottom wall, said floor comprising a grid or a grate with openings, jet means arranged below said bottom wall and above said floor, said jet means

being adapted to eject liquid from a level within said body of liquid and in a generally upward direction so as to agitate said body of liquid, and means to move said jet means while ejecting liquid in a generally oscillating or revolving pattern.

5,009,151

BARBECUING PROTECTIVE FOOD SUPPORT

Robert E. Hungerford, 116 Lake Desire Dr., N., Renton, Wash. 98058

Filed Apr. 14, 1989, Ser. No. 339,059
Int. Cl.[5] A47J *37/06*
U.S. Cl. 99—445 **13 Claims**

1. A protective food support comprising a plurality of substantially parallel troughs joined at spaced crests, said plurality of troughs having a first side and a second side, the first side of said plurality of troughs being a substantially inverted image of the second side of said troughs, said spaced crests on the first side being arranged to support food over said troughs and said spaced crests on the second side arranged to support the food support on a primary grill when the first side is the upper side, said plurality of troughs being invertible so that said spaced crests on the second side of said plurality of troughs are arranged to support food over said troughs and said spaced crests on the first side are arranged to support the food support on a primary grill when the second side is the upper side, wherein said plurality of troughs on the first side have integral first end dams to prevent food juices from flowing from one trough to another trough when the first side of said troughs is the upper side, said first end dams blocking less than substantially the entire ends of said troughs, and further wherein said plurality of troughs on the second side have integral second end dams to prevent food juices from flowing from one trough to another trough when the second side is the upper side, said second end dams blocking less than substantially the entire ends of said troughs.

5,009,152

REVERSE DIFFUSING BAFFLE FOR APPLYING SPROUT INHIBITOR TO STORED POTATOES

Charles R. Morgan, 4659 Enterprise St., Boise, Id. 83705

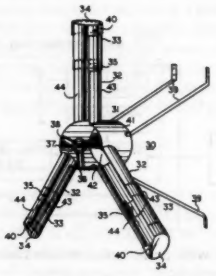
Continuation-in-part of Ser. No. 447,612, Dec. 28, 1989, Pat. No. 4,977,825. This application Sep. 5, 1990, Ser. No. 577,488
Int. Cl.[5] A23B *7/00*
U.S. Cl. 99—476 **4 Claims**

1. A diffusing baffle for use in applying sprout inhibiting chemicals to potatoes stored in a potato storage facility having an air supply plenum, a fan for discharging air into the air supply plenum, and a plurality of ventilation pipes open to the air supply plenum for delivering air to the stored potatoes, which comprises:

a central plenum receiving baffle having a convex outer surface and a concave inner surface;

means for introducing a sprout inhibiting chemical into said central plenum receiving baffle;

a plurality of elongated channel shaped radial arms having convex outer surfaces and concave inner surfaces attached to and extending radially out from said central plenum receiving baffle so as to form radially extending channels for the transport of sprout inhibiting chemical from the introduction means to the ends of said arms; and



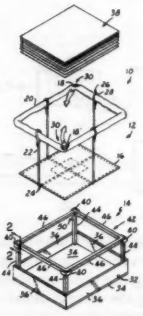
means for centrally positioning the central plenum receiving baffle and the radial arms in front of the discharge of the fan with the convex outer surfaces facing the fan.

5,009,153

DEVICE AND METHOD FOR BUNDLING

Joel T. Kaji, 27519 Gateway N., #204, Farmington Hills, Mich. 48018

Filed Feb. 20, 1990, Ser. No. 482,189
Int. Cl.[5] B65B *13/02*
U.S. Cl. 100—2 **16 Claims**



16. A method for binding a stack of items, such as newspapers, the method comprising the steps of:

providing a bundling device having a tie assembly including a seat member, a drawband forming a closed loop, and a plurality of ties, each tie having a base end attached to the seat member and a draw end forming a loop slidably encircling one thickness of the drawband, and having a receptacle including a tray having a horizontal bottom to support the seat member and further having sides extending upwardly from the bottom;

inserting the tie assembly into the receptacle so that the seat member of the tie assembly rests upon the bottom of the receptacle;

forming the drawband into a generally horizontal loop disposed above the bottom and outside the receptacle, the ties being draped over the sides, thereby supporting the drawband;

stacking the items to be bound upon the seat member;

pulling upwardly on the drawband at two points separated by the loop in the draw end of at least one tie, thereby simultaneously and equally tightening the ties about the stacked items and forming, of two respective portions of the drawband, elongated loops; and

tying the two elongated loops together to secure the ties in their tightened positions.

5,009,154

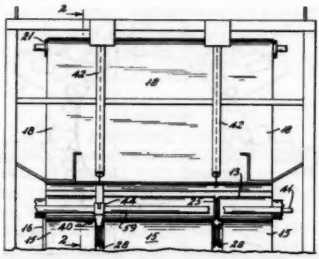
TWINE FEEDING APPARATUS FOR ROUND HAY BALERS

Rudolph Boes, P.O. Box 112, Big Falls, Minn. 56627

Filed Feb. 7, 1990, Ser. No. 476,167

Int. Cl.[5] B65B *63/04;* **B30B** *5/06*

U.S. Cl. 100—5 **5 Claims**



1. In a baling machine for baling round bales of incoming hay wherein the machine includes a feed press roller mounted to a roller drive shaft so as to be in substantially parallel relationship to a main belt drive drum which is rotatably carried by a drum drive shaft and wherein a plurality of spaced hay rolling belts are drivingly engaged to the main belt drive drum in spaced relationship to one another and wherein the machine includes a source of twine from which twine is directed to a twine feed means so that the twine may be selectively urged between the hay feed roller and the main belt drive drum the improvement comprising, forming each of the hay feed press roller and main belt drive drum with at least two-spaced cylindrical segments which are aligned along their respective drive shafts, a first sheave means freely rotatably mounted about the roller drive shaft intermediate said segments of said hay feed press roller, second sheave means freely rotatably mounted to said drum drive shaft and intermediate said sections of the main belt drive drum, said first and second sheaves being aligned in space relationship with respect to one another, the twine feed means including a feed element adjacent said first and second sheaves, said feed element being engageable with the twine, means for urging said feed element toward said first and second sheave means so that an intermediate length of the twine is aligned between said first and second sheave means so as to be engageable by incoming hay, said intermediate portion of said twine being guided between said first and second sheaves so as to expand into a loop about the incoming hay as the hay is rolled, and a knotting and cutting means for knotting the twine to form a continuous loop about the rolled bale of hay and therafter to cut the twine whereby the rolled and tied bale may be discharged from the baling machine.

5,009,155

CAN CRUSHER FOR HOUSEHOLD USE

Konrad A. Christianson, 190 Cutler Dr., Durango, Colo. 81301

Filed Mar. 30, 1989, Ser. No. 331,642

Int. Cl.[5] B30B *7/00, 1/02*

U.S. Cl. 100—233 **7 Claims**

1. A device for crushing common cylindrical beverage cans comprising:

an elongated flat back plate having a front face and a center plane parallel to its front face,

lever means having one end pivotably attached to said back plate at said center plane near one end of the back plate and having a handle at the other end of the lever means,

a stationary compressor base plate fixedly mounted on said back plate near the longitudinal center thereof and perpendicular to said back plate, said compressor base plate being essentially flat and having two opposite sides,

one of said sides having a surface for engaging an end of a common cylindrical can,

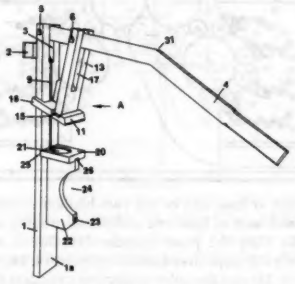
a movable ram assembly comprising an elongated drive member with a flat compressor drive plate rigidly connected to one end of the drive member, wherein a can is crushed between said base plate and the drive plate of said ram assembly,

the other end of the elongated drive member of said ram assembly being pivotably fastened to said handle at a single point therealong, said drive plate being slidably fastened to said back plate,

said back plate and said compressor drive plate further comprising longitudinal guide means to direct the sliding movement of said ram assembly with one portion of said drive plate sliding along a face of said back plate in a linear path and said ram assembly pivotably moving relative to said back plate,

the drive plate of said ram assembly having a substantially planar face to contact the other end of a can positioned against the stationary compressor base plate,

said ram assembly being movable, by manual operation of said lever means using a single stroke, between an open position for receiving a can to be crushed and a closed position in which the can is fully crushed,



the face of said ram assembly being parallel to and spaced from said stationary plate with the can crushed therebetween when in the closed position,

said ram assembly face being substantially inclined to said base plate when the ram assembly is moved into initial contact with the end of a can to cause initial collapse of the can at one side of the can,

said lever means comprising two straight lever arm portions angularly joined to each other at a bend which lies about midway along the length of the lever means, said bend being opposite the compressor drive plate in the closed position of the ram assembly, the handle of said lever means lying opposite the other end of the elongated back plate in the closed position of the ram assembly,

said compressor base plate being further supported relative to said back plate by a brace portion at said side of the compressor base plate opposite its can-engaging surface,

said brace portion being provided with a stop located substantially beyond the compressor base plate and engageable with said lever means at a point spaced from aid bend and near said handle to prevent movement of the handle beyond a position corresponding to a fully crushed can.

5,009,156

MULTI-COLOR ROTARY PRINTING MACHINE FOR SIMULTANEOUS RECTO-VERSO PRINTING

Albrecht J. Germann, Wurzburg, Fed. Rep. of Germany, assignor to De La Rue Giori S.A., Lausanne, Switzerland

Filed May 4, 1989, Ser. No. 347,402

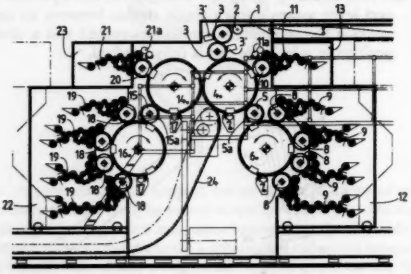
Claims priority, application Switzerland, May 18, 1988, 1887/88

Int. Cl.[5] B41F *5/16, 5/22;* **B41L** *15/10*

U.S. Cl. 101—177 **7 Claims**

1. A multi-color rotary printing machine for simultaneous recto-verso printing, especially for printing the safety back-

ground on security papers, means for feeding paper through said printing machine, with two interacting blanket cylinders (4, 14), between which the paper (1) to be printed runs through, thereby being printed on both sides, two plate cylinders (5, 15), each of which carries a respective collect-printing plate (5a,15a) and is in contact with one of the two blanket cylinders (4, 14), several color selector cylinders (8, 18), two color-collecting cylinders (6, 16) which are arranged at a distance from one another and each of which is in contact on the one hand with one of the plate cylinders (5, 15) and on the other hand with a respective one of said several color selector cylinders (8, 18), each said color selector cylinder being inked by an associated inking unit (9, 19), each color-collecting cylinder transferring all the colors obtained from the color selector cylinders in contact with it onto the respective collect-printing plate, at least one additional printing unit having a plate cylinder, wherein at least one of the two blanket cylinders (4, 14) interacts with said at least one additional printing unit (10, 11, 11a; 20, 21 21a), the plate cylinder (10; 20) of which is in contact with the respective blanket cylinder (4; 14), the blanket cylinders (4, 14) and the color-collecting cylinders (6, 16) being of the same size and having a diameter which is an integral multiple of the diameter of the plate cylinders (5, 15, 10, 20) and of the color selector cylinders (8, 18), the two color-collecting cylinders (6, 16) being arranged symmetrically underneath the two interacting blanket cylinders (4, 14) and respectively offset obliquely outwards relative to these and being at a distance from one another which is at least as large as their diameter, the collect-printing plate cylinders (5, 15) being arranged on the top of the color-collecting cylinders (6, 16) and the underside of said color-collecting cylinders being freely accessible.



5,009,157

ROTARY PRESS COMPRISING AN ENDLESS BLOCK BELT

Dieter Rogge, and Wilfried Wallmann, both of Lengerich, Fed. Rep. of Germany, assignors to Windmoller & Holscher, Lengerich, Fed. Rep. of Germany

Filed Apr. 19, 1989, Ser. No. 340,204

Claims priority, application Fed. Rep. of Germany, Apr. 19, 1988, 3813112

Int. Cl.[5] B41F 5/18, 13/00

U.S. Cl. 101—178 11 Claims

1. A rotary press comprising:

at least one impression cylinder; and

a plurality of printing units around said impression cylinder, each printing unit comprising:

an inking unit,

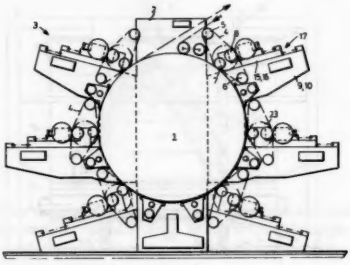
four printing unit cylinders disposed relative to each other substantially at corners of a parallelogram, said four cylinders being comprised of two diametrically opposite printing cylinders and two diametrically opposite tensioning cylinders,

an endless block belt extending around and in engagement with said four cylinders,

a first one of said printing cylinders being adjacent said at least one impression cylinder and the other of said printing cylinders being adjacent said inking unit,

track means,

means for mounting said tensioning cylinders in said track means for movement toward and away from each other; and



means for mounting each printing unit so that said first printing cylinder engages said block belt against said at least one impression cylinder and said other printing cylinder engages said block belt with said inking unit.

5,009,158

OFFSET PRINTING MACHINE SYSTEM

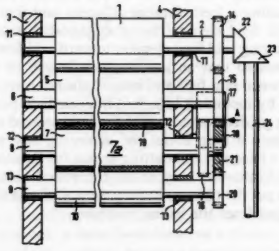
Thomas John, and Georg Bock, both of Augsburg, Fed. Rep. of Germany, assignors to MAN Roland Druckmaschinen AG, Offenbach am Main, Fed. Rep. of Germany

Filed Jun. 25, 1990, Ser. No. 542,879

Claims priority, application Fed. Rep. of Germany, Jul. 8, 1989, 3922559

Int. Cl.[5] B41F 5/04

U.S. Cl. 101—219 13 Claims



1. Offset printing machine system having

a rubber blanket cylinder (1, 30), having a blanket cylinder shaft (2, 34);

a plate cylinder (5, 31) having a plate cylinder shaft (6, 35);

an ink application cylinder (7, 32) having an ink cylinder shaft (8, 36);

a yielding surface covering (19, 48) on said ink application cylinder;

means (14, 15; 40, 44) for driving said blanket cylinder shaft and said plate cylinder shaft at the same speed, including plate cylinder gear means (15, 44) secured to the plate cylinder shaft (6, 35),

said cylinders being engaged against each other and rolling off against each other, and defining engagement regions at the respective nips between said cylinders,

wherein, in accordance with the invention,

the diameter of the ink application cylinder (7, 32) differs from the diameter of the plate cylinder (5, 31) when said cylinders are engaged against each other; and

wherein said drive means includes

means for driving the ink application cylinder (7, 32) at a circumferential speed corresponding to the speed of the plate cylinder (5, 31) to cause the engagement region of the ink application cylinder and of the plate cylinder to move at the same speed,

and wherein said ink application cylinder driving means compensate for differences in effective diameter at said engagement region between the ink application cylinder and the plate cylinder, while maintaining said corresponding circumferential speeds of the ink application cylinder (7, 32) and the plate cylinder (5, 31).

5,009,159

PRINTING UNIT

Jan N. Stenqvist, Mosshult 3580, S-260, 60 Kvidinge, Sweden

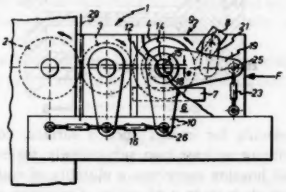
PCT No. PCT/SE88/00052, § 371 Date Aug. 10, 1989, § 102(e) Date Aug. 10, 1989, PCT Pub. No. WO88/06097, PCT Pub. Date Aug. 25, 1988

PCT Filed Feb. 12, 1988, Ser. No. 382,691

Claims priority, application Sweden, Feb. 13, 1987, 8700575

Int. Cl.[5] B41F *31/04, 31/34, 31/06;* B41L *27/36*

U.S. Cl. 101—351 **7 Claims**



1. A printing unit (1) comprising a rotary impression cylinder (3), an inking device (9), a rotary inking roller (4) in said inking device, said impression cylinder and inking device being mounted on a machine frame, said inking roller (4) having an axis of rotation (18) defining a shaft, means for adjusting said inking roller toward and away from said impression cylinder, said means including a first lever device (10, 11) which is pivotal about a pivot axis (15) and eccentrically mounted in relation to the axis of rotation (18) of said inking roller, said inking roller being mounted and rotatably supported by said first lever device, the printing unit (1) further having a doctor blade (8) movable into wipe-off engagement with the inking roller (4), a second pivotal lever device (19, 20) concentrically mounted in relation to the axis of rotation (8) of the inking roller (4) and eccentrically mounted for pivotal movement in relation to the pivot axis (15) of the first lever device (10, 11), said doctor blade (8) being mounted on and supported by said second lever device (19, 20), whereby the doctor blade (8) and the inking roller (4) will maintain their relative positions when adjusting the spacing between the inking roller (4) and the impression cylinder (3) by displacement of said first lever device (10, 11).

5,009,160

TRANSFER CYLINDER FOR PRINTING PRESS

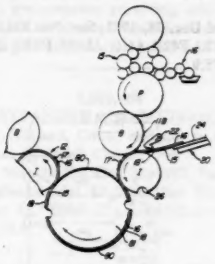
Eduardo Duarte, 528 Rawls Cir., Irving, Tex. 75061

Continuation-in-part of Ser. No. 191,322, May 9, 1989, Pat. No. 4,967,661, which is a continuation-in-part of Ser. No. 58,892, Jun. 5, 1987, Pat. No. 4,836,104. This application Aug. 30, 1989, Ser. No. 400,694

Int. Cl.[5] B41F *13/08*

U.S. Cl. 101—422 **16 Claims**

1. A transfer cylinder for a printing press comprising: a film of polycarbonate bonded to the surface of the transfer cylinder, said film having a roughened surface on one side and a matte finished surface on the other side, said roughened surface being bonded to the surface of said transfer cylinder; and a film



of silicone on the matte finished surface of said film forming an ink repellant surface.

5,009,161

DEVICE FOR CLEANING SHEET-TRANSFER CYLINDERS IN ROTARY PRINTING PRESSES

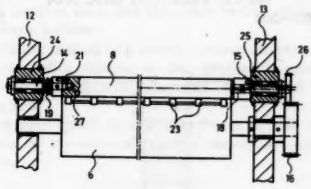
Arno Wirz, Bammental, Fed. Rep. of Germany, assignor to Heidelberger Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany

Filed Apr. 17, 1989, Ser. No. 339,065

Claims priority, application Fed. Rep. of Germany, Apr. 16, 1988, 3812678

Int. Cl.[5] B41F *35/00*

U.S. Cl. 101—425 **6 Claims**



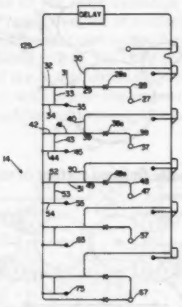
1. Device for keeping an outer cylindrical surface of a sheet-conveying cylindrical member clean for the purpose of conveying sheets with freshly printed surfaces in a sheet-fed rotary offset printing machine, comprising a roller having an outer cylindrical surface continuously in engagement with the outer cylindrical surface of the sheet-conveying cylindrical member at regions thereof free from engagement by the sheets, the outer cylindrical surface of the sheet-conveying cylindrical member being textured and having means for, respectively, transferring and repelling ink, said surface of said roller continuously in engagement with the outer cylindrical surface having means for removing and storing ink, and including means at least partly carried by said roller for replacing said roller when its means for removing and storing ink ceases to function, said replacing means include, at both ends respectively, of said roller, parts of quick-fitting couplings, and complementary parts of said couplings incorporated in bearings supported in side walls of the printing machine.

5,009,162

EXPLOSIVE LOGIC RESOLVER NETWORK

Denis A. Silvia, Aberdeen, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 28, 1981, Ser. No. 334,849
Int. Cl.[5] F42B *3/10, 15/00*; F42C *19/08*
U.S. Cl. 102—275.9 **10 Claims**



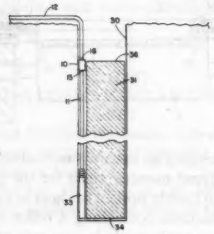
1. An explosive logic network for resolving a first detonation signal from a plurality of detonation signals, comprising:
detonation signal means;
explosive trail means propagating the detonation signals from the detonation signal means; and
resolution means extinguishing all detonation signals in the explosive trail means except for a first detonation signal.

5,009,163

NON-ELECTRIC SIGNAL TRANSMISSION DEVICE CONNECTION, METHOD AND APPARATUS THEREFOR

Kendall H. Robins, Bloomfield; Dennis K. Austin, and Richard W. Spraggs, both of Simsbury, all of Conn., assignors to The Ensign-Bickford Company, Simsbury, Conn.

Filed Apr. 19, 1990, Ser. No. 511,077
Int. Cl.[5] F42B *3/00*; C06C *5/04*
U.S. Cl. 102—301 **14 Claims**



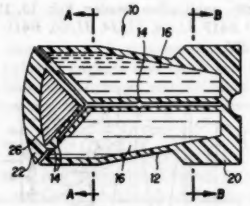
12. The method of detonating an explosive column with a consumable, low-residue producing blasting system having a detonator adjacent to the bottom of the explosive column, the method comprising the steps of:
providing a length of detonating cord between an initiating point of the system and the top of the explosive column;
providing a length of shock tube between the explosive column top and the detonator;
providing a length of heat-shrinkable tubing;
inserting said detonating cord through said tubing;
axially aligning an end of said shock tube and an end of said detonating cord at the explosive column top at a sufficiently close distance from one another for reliable signal propagation therebetween;
sliding said tubing over said aligned ends; and
heating said tubing, thereby shrinking said tubing for providing axial compressive and radial compressive forces on said ends.

5,009,164

NON-PENETRATING PROJECTILE AND MEANS THEREFOR

Oded Grinberg, Mazkeret Batya, Israel, assignor to MNY Holdings and Agencies Limited, Tel-Aviv, Israel

Filed Dec. 29, 1988, Ser. No. 291,502
Claims priority, application Israel, Jan. 11, 1988, 85079
Int. Cl.[5] F42B *5/145, 8/14, 12/40*
U.S. Cl. 102—502 **14 Claims**



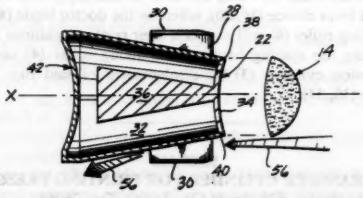
1. A projectile for impact upon a surface, comprising a housing defining at least two substantially sealed chambers wherein said housing comprises a plurality of walls of a first thickness which include a plurality of portions of a second thickness thinner than said first thickness, at least one of said walls being of a double leaf construction, said second thickness portions being located on said wall in order to provide points of stress which will fracture when the projectile impacts with a surface.

5,009,165

JACKETED PAINT PELLET

James K. Morris, 7004 S. 12th, #2106, Tacoma, Wash. 98465

Continuation-in-part of Ser. No. 273,850, Nov. 18, 1988, abandoned. This application Mar. 26, 1990, Ser. No. 499,556
Int. Cl.[5] F42B *12/40*; A63B *65/02*
U.S. Cl. 102—513 **23 Claims**



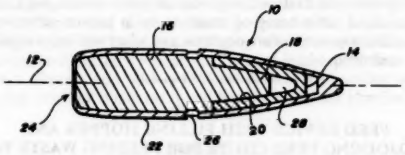
1. A jacket for holding and stabilizing a gelled pellet of paint as it travels through the bore of a gun barrel and in flight, the jacket comprising:
a body formed of lightweight nonmetallic material having a leading end and a trailing end, the leading end having a forward-facing substantially concave mounting surface
means connected to said body for supporting said body within the bore of the gun barrel and means connected to said body for guiding the body through the air in flight.

5,009,166

LOW COST PENETRATOR PROJECTILE

Stephen J. Bilsbury, Bethlehem, Pa.; William G. Dennis, Jr., Florissant, Mo., and Stephen K. Kernosky, Godfrey, Ill., assignors to Olin Corporation, Cheshire, Conn.

Filed Jul. 31, 1989, Ser. No. 388,178
Int. Cl.[5] F42B *12/06*
U.S. Cl. 102—516 7 Claims



1. A small caliber hollow cone penetrator projectile comprising:

a hard strip metal carburized penetrator core having a generally hollow conical shape, said core being formed in a series of progressive dies from a strip of low carbon steel and then carburized to a uniform Rockwell hardness of at least C50;

a generally soft heavy metal slug body behind said core, said body having a portion extending centrally within said hollow core; and

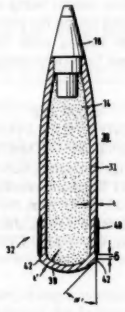
a metal jacket over said body and said penetrator core enclosing said core and at least a portion of said body.

5,009,167

HIGH-EXPLOSIVE PROJECTILE

Achim Sippel; Heinz-Josef Kruse, both of Ratingen, and Wilfried Becker, Düsseldorf, all of Fed. Rep. of Germany, assignors to Rheinmetall GmbH, Düsseldorf, Fed. Rep. of Germany

Filed Jan. 12, 1989, Ser. No. 296,150
Claims priority, application Fed. Rep. of Germany, Feb. 12, 1988, 3804351
Int. Cl.[5] F42B *12/20, 14/02*
U.S. Cl. 102—524 18 Claims



11. In a high-explosive projectile including a projectile body having a forward region and a tail region which transitions to a base, an explosive charge disposed within said body and detonated by a suitable fuse, and a driving band disposed on the outer circumferential surface of said projectile body in said tail region, the improvement wherein:

the wall thickness of said tail region of said projectile body is substantially the same as the wall thickness of said forward region of said projectile body;

said tail region of said projectile body has a cylindrical shape up to its transition to said base and forms a circumferential edge at said transition;

said projectile base has approximately the same wall thickness as said projectile body;

said driving band has a width of at least twice said wall thickness; and

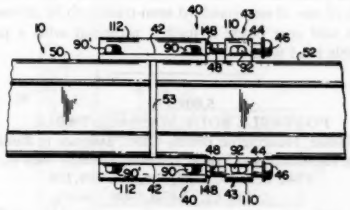
the rearward, gas pressure receiving side of said driving band is located a distance from said circumferential edge which is no greater than twice said wall thickness.

5,009,168

TRACK EXPANDER AND METHOD OF USE

Richard Kuchta, Tolland, Conn., assignor to Gerber Garment Technology, Inc., Tolland, Conn.

Division of Ser. No. 429,205, Oct. 30, 1989, Pat. No. 4,967,669.
This application Jul. 19, 1990, Ser. No. 555,929
Int. Cl.[5] E01B *25/22;* B65G *23/44*
U.S. Cl. 104—172.1 3 Claims



1. A method of spreading apart adjacently disposed ends of two track sections to accomplish tensioning of an endless chain traveling through said track sections in a conveyorized transport system, said method comprising:

providing a splice capable of being separately connected with each of said adjacently disposed ends of said track sections;

mounting said splice to said adjacently disposed ends of said track sections;

providing an expander body and fixing it to one of said track sections adjacent said splice;

providing take-up means between said expander body and said splice;

securing said splice against movement at the other of said track sections such that the splice moves relative to said one track section;

manipulating said take-up means to move the expander body and the splice relative to one another to create a gap between said adjacently disposed ends of said track sections; and

securing said splice against movement at said one track section to maintain said gap achieved by said take-up means.

5,009,169

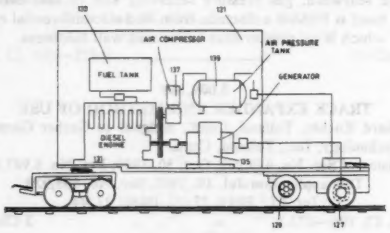
TWIN AXLE RAIL BOGIE FOR CONVERTIBLE RAIL-HIGHWAY VEHICLES

Jacques Viens, 1486 Bellemare, Roxton Pond, Quebec, Canada J0E 1Z0

Division of Ser. No. 333,053, Apr. 4, 1989, Pat. No. 4,938,151.
This application Apr. 20, 1990, Ser. No. 512,224
Int. Cl.[5] B61F *3/12*
U.S. Cl. 105—4.1 3 Claims

1. A motorized unit for driving a train on rails in which the train is made up of a plurality of standard convertible rail-highway semi-trailers carried by rail bogies and hooked thereto through a fifth-wheel means including a coupling king pin, said motorized unit comprising: a power semi-trailer of a convertible rail-highway type having a coupling king pin arrangement at one end for connection with a rail bogie of one of said standard semi-trailers; a rear bogie solid with the other end of said power semi-trailer and provided with a pair of railroad driving wheels operatively connected to said power semi-

trailer to be driven thereby, said rear bogie having an upper surface that projects rearwardly of said power semi-trailer and is provided with a fifth wheel, said rear bogie fifth wheel being



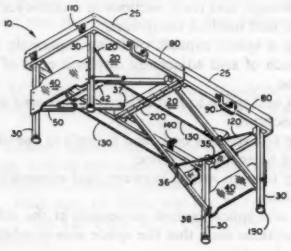
sized and positioned to receive and interlock with a coupling king pin of one of said standard semi-trailers to be driven, and wherein said rear bogie is further provided with a pair of retractable road wheels.

5,009,170

PORTABLE BODY MASSAGE TABLE

Eli G. Spehar, Huntington Beach, Calif., assignor to Rodney B. Smith, Escondido and Ernest L. Ostic, Orange, both of, Calif.

Filed Feb. 10, 1989, Ser. No. 309,784
Int. Cl.[5] A47B *3/00*
U.S. Cl. 108—36 **4 Claims**



1. A portable, folding table comprising:

a pair of rectangular table top sections;

a peripheral border flange depending from each of said sections;

hinge members interconnecting said flange bottom edges of adjacent sides of said sections to enable folding of said table top sections from a working configuration, wherein said table top sections are coplanar, to a portable configuration, wherein the bottom edges of said flanges are juxtaposed;

two pairs of support legs of rectangular cross section;

a first means hingably securing a first end of each said pair of legs to the underside of each said table top section to fold toward said hinge members within said border flange;

a first rigid cross brace secured between the legs of each pair thereof;

two pairs of support arms of rectangular cross section, each said arm comprising a first and a second section pivotally interconnected by a second pivot means securing facing sides of each to the other;

a third pivot means hingably securing a first end of each said pair of arms to the underside of each said table top section to fold toward said table top section within said border flange;

a fourth pivot means securing a second end of each said pair of arms to said pair of legs to fold toward said table top section into the receptacle formed by said border flange;

a second rigid cross brace secured between the arms of each pair thereof;

a pair of first flexible, non-stretchable cables, one of said cables being pivotally secured between each opposing pair of said second pivot means, each said cable being of length to be in tension when said table top sections are coplanar and when said legs are fully unfolded;

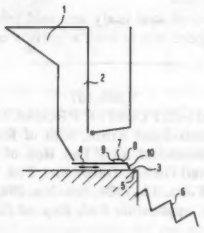
two pairs of flexible, non-stretchable second cables, each individual said second cable being pivotally secured between said first and said second pivot means, each said second cable being of length to be in tension when said table top sections are coplanar and when said legs are fully unfolded.

5,009,171

FEED DEVICE WITH FILLING HOPPER AND ADJOINING FEED CHUTE FOR FEEDING WASTE TO INCINERATION PLANTS

Johannes J. E. Martin, and Walter J. Martin, both of Munich, Fed. Rep. of Germany, assignors to Martin GmbH fur Umweld-und Energietechnik, Munich, Fed. Rep. of Germany

Filed Jul. 18, 1989, Ser. No. 381,540
Claims priority, application Fed. Rep. of Germany, Jul. 29, 1988, 3825930
Int. Cl.[5] F23K *3/12, 3/16*
U.S. Cl. 110—109 **18 Claims**



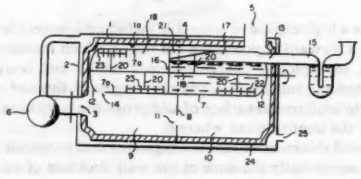
1. A feed device comprising: a filling hopper and adjoining feed chute, feeding pistons being provided at the lower end of the feed chute for conveying waste to an incineration plant, retaining and compression means being arranged on the upper side of at least one feeding piston for preventing waste fed into the filling hopper from sliding over the feed pistons in an uncontrolled manner and for compressing the waste.

5,009,172

METHOD FOR AND APPARATUS OF THERMAL TREATMENT OF HUMAN WASTE

Shigeyuki Koga, and Shigeki Sugiue, both of Takamatsu, Japan, assignors to Kabushiki Kaisha Toyoseiakusho, Japan

Filed Jul. 25, 1989, Ser. No. 384,345
Claims priority, application Japan, Jul. 29, 1988, 63-191532
Int. Cl.[5] F23G *5/00*
U.S. Cl. 110—242 **4 Claims**



1. Apparatus for thermal treatment of human waste comprising: an inner barrel partitioned by a wall having a space in its upper part into a reservoir chamber for reserving human waste

through an inlet and a flash chamber having an outlet for feeding said human waste from said space by a drawing water barrel to decompose said waste into a gaseous smelling water vapor component and a residue; an outer barrel in which said inner barrel is disposed in an upper part and partitioned by a wall penetrating said inner barrel in an upper part thereof provided with a through hole for intercommunicating in a lower part thereof into a smell removing chamber for removing said gaseous smelling component fed from said outlet; a discharge gaseous chamber having an outlet for discharging gas fed from said smell removing chamber through said through hole for intercommunicating after removal of said gaseous smelling component; and a heat intake port from a burner wherein said inlet is adjacent thereto for burning said gaseous smelling component and heating said flash chamber.

5,009,173

APPARATUS FOR INCINERATION OF REFUSE

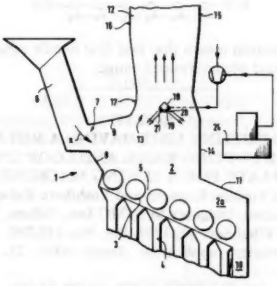
Sedat Temelli, Erkrath, Fed. Rep. of Germany, assignor to Mullverbrennungsanlage Wuppertal GmbH, Fed. Rep. of Germany

Division of Ser. No. 172,085, Mar. 23, 1988, Pat. No. 4,940,006. This application Jan. 16, 1990, Ser. No. 465,392

Claims priority, application Fed. Rep. of Germany, Apr. 9, 1987, 3712039; May 14, 1987, 3716088

Int. Cl.[5] F23G *5/00*

U.S. Cl. 110—244 **8 Claims**



1. Combustion vessel for refuse incineration or the like, comprising:

a furnace space with a grate for receiving refuse to be burned;

a refuse feeder located above the grate;

the furnace space having an afterburning zone at an upper part above the grate for receiving the flue gases formed by combustion of the refuse, the afterburning zone having a throttled area facing in the direction of the oncoming flue gases to dam the flue gases before entering the afterburning zone so as to increase the retention time of the flue gases in a uniform temperature zone of the furnace space;

a flue gas exhaust located downstream from the throttled area;

the throttled area comprising a venturi symmetrical in cross section perpendicular to the longitudinal direction of the flue gas exhaust so as to accelerate the flow of flue gases in a venturi-like manner in the afterburning zone while creasing a laminar flow of the flue gases and then to decelerate the flow of flue gases in a venturi-like manner in the afterburning zone without increasing the turbulence of the flue gases; and;

a nozzle bar located across and immediately upstream from the throttled area and having plural nozzle openings operative to inject jets of secondary air forming a substantially continuous grid pattern across the entire cross section of the flow of flue gases before the flue gases enter the throttled area, and in a direction opposite to the flow of flue gases flowing toward the afterburning zone so that no stream of flue gas can penetrate into the throttled area without coming into intimate contact with the injected secondary air,

so as to further increase the retention time of the flue gases in the furnace space and thereby completely burn out the combustible constituents entrained in the flue gases before entering the afterburning zone, so as to reduce the unwanted gaseous components in the flue gases.

5,009,174

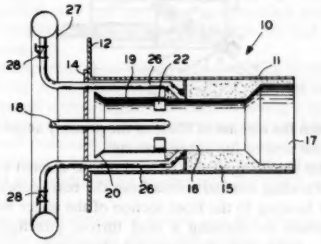
ACID GAS BURNER

Bob Polak, Toronto, Canada, assignor to Exxon Research and Engineering Company, Florham Park, N.J.

Continuation of Ser. No. 403,258, Dec. 2, 1985, abandoned. This application Nov. 17, 1986, Ser. No. 931,136

Int. Cl.[5] F23D *1/02*

U.S. Cl. 110—264 **8 Claims**



1. A burner for combusting a waste gas comprising:

a throat section;

a fire tube downstream from said throat section in communication therewith;

an air duct section upstream from said throat section in communication therewith;

a centrally located nozzle means for introduction of a fuel in said throat section in a downstream direction toward said fire tube;

means upstream from said throat section for forming a downstream directed swirling combustion air stream substantially in an annular ring along the sidewalls of the throat section;

means for introducing a waste gas stream into the throat section downstream of the nozzle means in a forwardly biased but swirling direction opposite to that of said swirling combustion air stream.

5,009,175

POTATO PLANTER

David A. Pember, P.O. Box 132, and James R. Schrader, P.O. Box 996, both of Glenns Ferry, Id. 83623

Filed Jan. 24, 1990, Ser. No. 469,228

Int. Cl.[5] A01C *5/06, 9/08*

U.S. Cl. 111—173 **6 Claims**

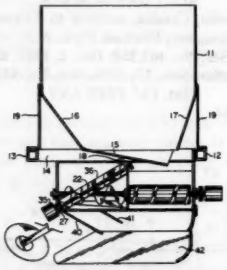
1. An improved potato planter having a perimeter frame supporting a seed hopper, a hopper drop chute, and shaker plate to prevent the bridging of seed potato pieces in the drop chute and axle and wheel means, wherein improvement comprises:

a generally horizontally oriented auger housing divided into a forward section and rear section by an attached transverse intermediate support plate, and with the forward section open at the top, and a downwardly opening discharge chute at the rearmost end, for receiving pieces of seed potato from the hopper drop chute through the open top of the front section;

a primary single blade auger disposed longitudinally within said auger housing for axial rotation within said auger housing;

a secondary filler blade auger disposed within the front section of said auger housing in interfitting parallel axial relationship with said primary auger so as to interfit the blade of the secondary auger between the reach of the blade of the primary auger on one side of the primary auger;

means for rotating both the primary and secondary augers in synchronized, but opposite directions so as to create traveling compartments for transporting pieces of seed potato



between the reaches of blade of the primary auger and the adjacent side of the auger housing;

means for returning pieces of seed potato ejected from the said traveling compartments from the rear section of the auger housing to the front section of the auger housing;

plow means for forming a seed furrow attached to the planter forward to the discharge chute; and

disking means for covering seed in the furrow attached to the planter behind the discharge chute.

5,009,176

SEWING DATA FORMING METHOD AND DEVICE FOR SEWING MACHINE

Katsunori Shigeta, and Haruyuki Nakamura, both of Aichi, Japan, assignors to Mitsubishi Denki K.K., Tokyo, Japan

Filed Jan. 17, 1990, Ser. No. 466,182

Claims priority, application Japan, Jan. 24, 1989, 1-14809

Int. Cl.[5] D05B *21/00*

U.S. Cl. 112—121.12 **15 Claims**

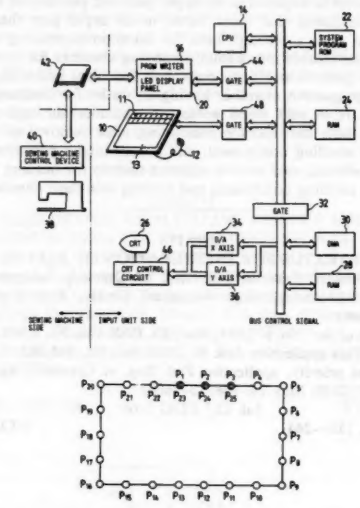
12. A device for forming sewing data for a sewing device, comprising:

coordinates input means for inputting coordinate values of a needle position;

operation means for controlling the coordinate values successively inputted from said coordinates input means to obtain first needle position data for a sewing machine;

detection means for detecting whether said first needle position data input is within a predetermined range from second needle position data which has been already inputted and

conversion means for replacing said first needle position data by said second needle position data when it is detected by



said detection means that said first needle position data is within said predetermined range.

5,009,177

THREAD CUTTING UNIT HAVING A ROTATABLY DRIVEABLE CUTTING KNIFE AND LOOP SPREADING PLATE FOR A SEWING MACHINE

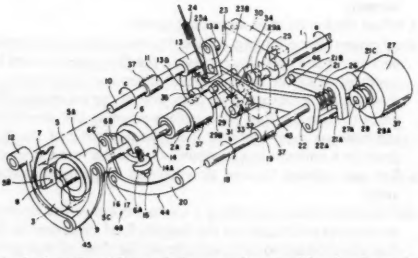
Shuichi Sato; Yoshimi Koguchi, and Yoshiharu Kobayashi, all of Tochigi, Japan, assignors to SSMC Inc., Edison, N.J.

Filed Sep. 22, 1989, Ser. No. 410,789

Claims priority, application Japan, Oct. 21, 1988, 63-137558[U]

Int. Cl.[5] D05B *65/02, 69/00, 65/00*

U.S. Cl. 112—292 **4 Claims**



1. A thread cutting unit in a sewing machine having a bed and comprising;

a lower shaft rotatably supported below the bed;

a needle movable vertically and held at a side of the bed;

a throat plate mounted on the bed;

a hook fixed to the lower shaft for cooperating with the needle, said needle extends beyond the throat plate at the time of stitching operation;

a thread cutting knife and a loop spreading plate respectively rotatably supported on the lower shaft and positioned adjacent to the hook, the thread cutting knife and the loop spreading plate crossing each other in the space between

the hook and the throat plate for cutting a sewing thread after completion of a series of stitching operations; and

a thread cutting driving unit for driving the thread cutting knife and the loop spreading plate;

wherein the thread cutting driving unit comprises:

a thread cutting knife driving shaft and a loop spreading plate driving shaft respectively rotatably supported below the bed of the sewing machine;

a rotational motion transmission device for respectively transmitting a rotational motion of the lower shaft to the thread cutting knife driving shaft and the loop spreading plate driving shaft;

a thread cutting supporting member having the thread cutting knife and rotatably supported below the bed;

a first turnable interlocking mechanism having interconnections at four different locations and having a driving body fixed to the thread cutting knife driving shaft and a driven body integrated with the thread cutting supporting member;

a loop spreading plate fixing member rotatably supported below the bed of the sewing machine and having a loop spreading plate; and

a second turnable interlocking mechanism having interconnections at four different locations and having a driving body fixed to the loop spreading plate driving shaft and a driven body intergrated with the loop spreading plate fixing member.

5,009,178

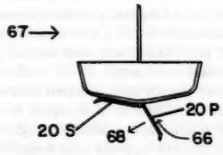
SELF ACTIVATING KEEL

Henry P. Geffken, RR1 Box 29-13, Hereford, Ariz. 85615

Filed Nov. 14, 1989, Ser. No. 437,454

Int. Cl.[5] B63B *41/00*

U.S. Cl. 114—143 **9 Claims**



1. A self activating stabilizer for a craft operating in a fluid medium, comprising:

(a) a fin means, which is pivotally mounted to the body of said craft such that said fin means swings on an axis that is approximately parallel to the intended direction of travel of said craft, and

(b) a limiting means such that the movement of said fin means relative to the body of said craft is restricted to a pivotal arc that is defined by said body and an acute angle to the direction of deviant fluid flow that is to be controlled by said fin means, and

(c) an activating means, shaped into said fin means, that offers a surface of the unacceptable angles of fluid flow across said body causing said fin means to swing away from said body to the acute angle defined by said limiting means thereby stabilizing said craft against undesireable angles of attack, and

(d) a deactivating means, shaped into said fin means, that offers a surface to the acceptable angles of fluid flow along said body causing said fin means to swing against said body thereby reducing the resistance to the foreward progress of said craft.

5,009,179

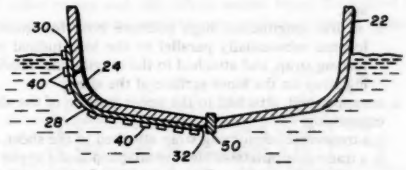
OIL SPILL CONTROL

Roscoe F. Johnson, 5650 N. Century Blvd., Century, Fla. 32535

Continuation-in-part of Ser. No. 380,881, Jul. 17, 1989, abandoned. This application Mar. 26, 1990, Ser. No. 498,920

Int. Cl.[5] B63B *43/16*

U.S. Cl. 114—229 **5 Claims**



1. Apparatus for stopping oil from leaking from a vessel having a hull, said hull having an outer surface and having a laden waterline, said hull having a rupture, said apparatus comprising:

A. an imperforate oil-impervious sheet-like flexible curtain having a top edge, a bottom edge, and first and second opposed lateral edges, said curtain having a length from said top edge to said bottom edge, said curtain having a width from said first to said second lateral edge;

B. said length being greater than the height of said rupture and said width being greater than the width of said rupture;

C. top sealing means for sealing said top edge to said outer surface of said hull above said rupture; and

D. lateral sealing means for sealing said lateral edges to said outer surface of said hull on opposite sides of said rupture from levels below said rupture upwardly to said top edge;

E. said bottom edge remaining mechanically unsealed to said hull, said curtain forming with said hull a downwardly-facing open pocket means for containing said oil and preventing further leakage after said pocket means is filled while permitting water to enter between said bottom edge and said hull.

5,009,180

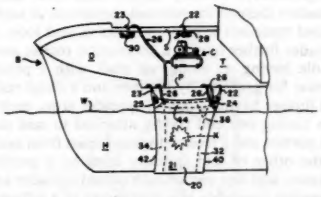
HULL HOLE CLOSURE FOR AN OIL TANKER

William T. Holt, 4610 Ellendale Rd., Memphis, Tenn. 38135

Filed Sep. 7, 1990, Ser. No. 579,365

Int. Cl.[5] B63B *43/16*

U.S. Cl. 114—229 **23 Claims**



13. A hull hole closure, for use with an oil tanker having a hull hole, said closure comprising:

a. a flexible, substantially waterproof sheet, shaped substantially similar to the bow of the tanker, for covering said hull hole and for extending under the keel and around the bow of the tanker from the port side to the starboard side of the tanker, said sheet comprising:

i. an aft edge, for location toward the stern of the tanker and passing under the keel of the tanker, said aft edge comprising a first end and a second end;

ii. an upper portion for location substantially above the water line of the tanker, said upper portion extending

substantially from the first end of the aft edge to the second end of the aft edge;

iii. an inner surface for placement substantially adjacent the hull of the tanker; and, iv. an outer surface for placement away from the hull of the tanker;

b. an aft belt, attached to the sheet substantially adjacent the aft edge of the sheet, said aft belt extending substantially from the first end of the aft edge to the second end of the aft edge, said aft belt comprising:

i. a longitudinal reinforcing strap attached to the sheet; and,

ii. a first longitudinal high pressure hose for inflation, located substantially parallel to the longitudinal reinforcing strap, and attached to the longitudinal reinforcing strap on the inner surface of the sheet;

c. an upper belt, attached to the upper portion of the sheet, comprising:

i. a transverse reinforcing strap attached to the sheet, and

ii. a transverse inflatable bladder attached to the upper belt on the inner surface of the sheet for inflation to substantially seal the upper portion of the sheet to the hull; and

d. means for securing the hull hole closure to the tanker.

5,009,181

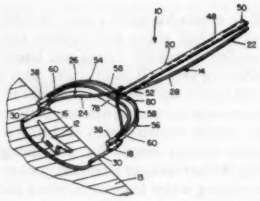
LINE HANDLING DEVICE

Paul E. Upchurch, P.O. Box 1529, Oak Harbor, Wash. 98277

Filed Jul. 12, 1990, Ser. No. 551,927

Int. Cl.[5] B63B *21/04*

U.S. Cl. 114—230 **42 Claims**



1. An apparatus to assist a user in tying a boat to an object, comprising:

a line having a first end portion attachable to the boat, a second end portion forming a loop positionable around the object, and a length of line extending between said first and second end portions;

first and second spreaders, each said spreader being disconnected from the other and having an aperture through which said second end portion of said line extends to independently, slidably mount said first and second spreaders thereon for selected movement of said first and second spreaders to opposite sides of said loop, each said spreader further having a connection recess; and

a handle having an elongated shaft with a proximal end portion for grasping by the user and a distal end portion, and further having a pair of spreader arms, each spreader arm having one end rigidly attached to said shaft distal end portion and a free end spaced apart from said free end of the other of said spreader arms by a predetermined distance, said free end of each of said spreader arms being releasably insertable into said recess of a different one of said first and second spreaders with said first and second spreaders positioned to opposite sides of said loop and spaced apart by about said predetermined distance to selectively hold said loop in an open position, said free ends of said spreader arms being releasable from said recesses of said first and second spreaders in response to the user pulling said handle in a direction away from the object with a predetermined separation force with said loop in place around the object to allow said loop to assume a closed position around the object uninhibited by said first and second spreaders or said spreader arms, whereby the user, while located at a distance from the object and holding said proximal end portion of said shaft, can easily place said loop around the object, and the user can selectively disconnect said first and second spreaders from said spreader arms by pulling on said handle so said loop can assume a closed position around the object for tying the boat to the object.

5,009,182

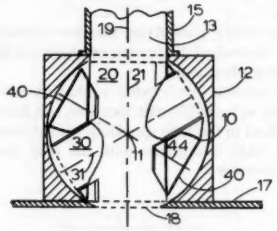
SUBMARINE TORPEDO TUBE SHUTTERWAY LAUNCH MODE ADAPTER

Paul E. Moody, Barrington, R.I., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 15, 1990, Ser. No. 568,304

Int. Cl.[5] B63G *8/00*

U.S. Cl. 114—238 **9 Claims**



1. A shutterway for a torpedo tube, said torpedo tube housing a torpedo of diameter d and having a centerline axis and an exit flow area, said shutterway comprising:

a means for creating a first passageway through said shutterway, said first passageway means having a flow area of diameter D and a line of axis passing through a center of said shutterway, wherein D>d when said first passageway line of axis is aligned with said torpedo tube center line axis;

a means for creating a second passageway through said shutterway, said second passageway means having a flow area of diameter d and a line of axis passing through said center of said shutterway, said second passageway line of axis oriented at an angle of 60° with respect to said first passageway line of axis, wherein said second passageway flow area of diameter d is equal to said torpedo tube diameter when said second passageway line of axis is aligned with said torpedo tube centerline axis; and

a means for closing off said torpedo tube exit flow area, said closing means having a line of axis passing through said center of said shutterway and oriented at an angle of 60° with respect to said first passageway line of axis and at an angle of 60° with respect to said second passageway line of axis, wherein said torpedo tube exit flow area is closed off when said closing means line of axis is aligned with said torpedo tube centerline axis.

5,009,183

TOWLINE AND RELEASE SYSTEM FOR WATER SPORTS ADJUNCT DEVICES

Frank R. Naypaver, 351 Florine Ave., Leavittsburg, Ohio 44430

Filed Dec. 14, 1989, Ser. No. 450,322

Int. Cl.[5] B63B *21/64*

U.S. Cl. 114—253 **11 Claims**

1. A towline and release system for water sports adjunct devices as inflated air tubes comprising:

a towline having a first portion thereof connected to a user handle and a second portion thereof adapted for connection to an adjunct device,

said second portion including releasable latch means for said adjunct device, and,

release means for said latch means, said release means being usable while said towline and adjunct device are under tow,

said release means including a manually actuated length of flexible lead extending from said latch means, with said flexible lead having means for slidable association with

said towline, and said means is slid with respect to said towline to release said latch,

wherein said slidable means is a bulbous member having a bore therethrough for reception of said towline therein whereby when mounted on said towline the bulbous member is carried thereby for engagement to release said latch means.

5,009,184

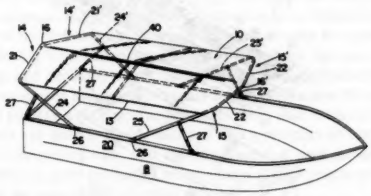
BOAT COVERS

Thomas Voldrich, 1014 Brookview, Parma, Ohio 44134

Filed Dec. 6, 1989, Ser. No. 446,658

Int. Cl.[5] B63B *17/00*

U.S. Cl. 114—361 **5 Claims**



1. A canopy for an open boat comprising a frame, the frame consisting of a pair of reversely L-shaped fixed angled tubular supports mounted on either side of the boat said supports having substantially horizontal and substantially vertical portions, means for connecting the supports to opposite sides of the boat, which accommodates a swiveling action about the gunwale and about the transverse axis of the boat, a hinged connection connecting each pair of supports, a cover being disposed over the supports and functioning as a member of the frame for frame support, the said hinged connection providing peaking at the centerline of the cover to afford side to side drainage of water.

5,009,185

APPARATUS FOR APPLYING A CONTROLLED AMOUNT OF REAGENT TO A MICROSCOPE SLIDE OR THE LIKE

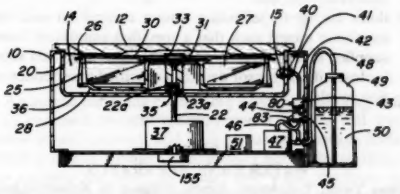
Barry O. Stokes, Logan; Gary D. Bradshaw, Wellsville, and Wayne K. Barlow, Providence, all of Utah, assignors to Wescor, Inc., Logan, Utah

Filed May 9, 1989, Ser. No. 350,106

Int. Cl.[5] B05C *11/02*

U.S. Cl. 118—52 **8 Claims**

1. Apparatus for applying a controlled amount of reagent to a microscope slide, comprising a spray chamber; carousel means for holding a plurality of slides to be sprayed and rotatably mounted in the spray chamber; nozzle means located in the spray chamber adjacent a portion of the carousel means for directing spray of reagent toward the slides held in the portion of the carousel means adjacent the nozzle means; means for rotating the carousel means at predetermined speeds in the spray chamber so as to move the slides mounted in the carousel means past the nozzles means; reagent reservoir means for storing a supply of reagent; pump means for pumping reagent from said reservoir means to said nozzle means; flow line means extending between said pump means and said nozzle means through which reagent can flow between said pump means and nozzle means; control valve means located in said flow line between said pump means and said nozzle means to control flow of reagent between said pump means and said nozzle means, the portion of said flow line extending between said valve means and said nozzle means being configured to eliminate pressure that would cause continued flow of reagent



from the flow line through the nozzle after closing of the control valve whereby spray of reagent into the spray chamber stops substantially immediately upon closing of the control valve; means to determine and monitor the angular position of the carousel means in the spray chamber; and control means responsive to the means to determine and monitor the angular position of the carousel means to coordinate operation of said pump means, valve means, and carousel means to accurately cause spray of reagent during predetermined known passage of the carousel means past the nozzle means whereby spray of reagent onto the slides is accurately controlled as the slides pass the nozzle means.

5,009,187

DEVELOPING DEVICE WITH SHUTTER

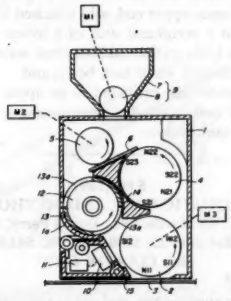
Masato Asanuma, and Masatoshi Kaneshige, both of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Aug. 4, 1988, Ser. No. 228,527

Claims priority, application Japan, Aug. 25, 1987, 62-129478[U]; Aug. 25, 1987, 62-129479[U]

Int. Cl.[5] G03G *15/09*

U.S. Cl. 118—658 **10 Claims**



1. A developing device comprising

a developing region where development takes place,

a toner receiving region,

a toner supplying means for supplying toner into said toner receiving region,

a toner supply route along which toner is delivered from said toner receiving region to said developing region,

a toner recycling route along which used toner is returned

from said developing region to said toner receiving region,

a shutter disposed in said toner supply route for selectably opening and closing said toner supply route,

a magnetic toner recycling roller disposed entirely in said toner recycling route for delivering used toner through said toner recycling route,

a partition member which is disposed between said shutter and said magnetic toner recycling roller and separates said toner supply route from said toner recycling route,

a sensor disposed along said toner supply route between said shutter and said developing region for detecting toner concentration, and

a timer circuit for effecting timing control on said toner supplying means such that a specified amount of toner is supplied into said toner receiving region after said shutter is closed if said sensor detects a specified toner concentration level.

5,009,188

WATER TANK APPARATUS

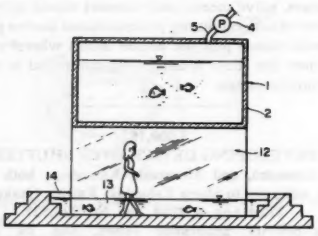
Mitsuo Yasui, Yokohama, Japan, assignor to Kabushikikaisha Kaichu Kyoju Kenkyu-sho, Tokyo, Japan

Filed Jul. 19, 1990, Ser. No. 555,568

Claims priority, application Japan, Oct. 3, 1989, 1-115891[U]; Oct. 12, 1989, 1-118760[U]

Int. Cl.[5] A01K *63/00*

U.S. Cl. 119—3 **7 Claims**



1. A water tank apparatus comprising:

a gas-tight water tank body made of a transparent material, for raising fishes and shellfishes or the like, aquatic life or the like;

an attached water tank made of a transparent material and having an open upper end, said attached water tank being attached to a peripheral wall of a lower portion of said water tank body so that said attached water tank communicates with said water tank body; and

a decompression unit provided at an upper end portion of said water tank body, for decompressing a space within the water tank body.

5,009,189

AQUATIC CAGE AND METHOD

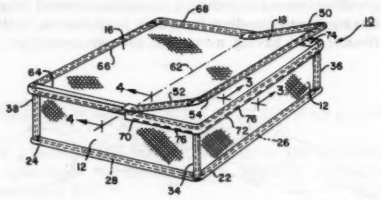
Gregor N. Neff, 85 Myrtle Ave., Dobbs Ferry, N.Y. 10522

Filed Jun. 25, 1990, Ser. No. 543,674

Int. Cl.[5] A01K *61/00*

U.S. Cl. 119—3 **13 Claims**

1. An aquatic animal cage, said cage comprising, in combination, an upwardly-extending side-wall made of a flexible netting material, a bottom-wall connected to said side-wall and forming, in combination with said side-wall, an aquatic animal enclosure, a plurality of upwardly-extending receptacle means secured to said side-wall and spaced apart from one another, each of said receptacle means being elongated and constructed to receive an elongated upwardlyextending support member which is stiff relative to said netting material of said side wall, and is adapted, when said receptacles contain such support members, to support said side wall above the ground when said



bottom-wall is on the ground, and to allow said side-wall to fold and collapse when said support members are removed.

5,009,190

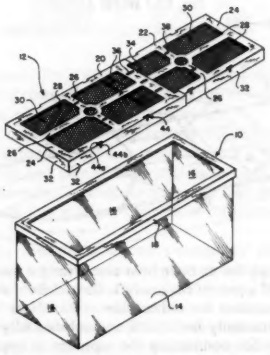
TANK COVER III

Richard A. Gordon, 95 W. 3rd St., Freeport, N.Y. 11520

Filed Aug. 14, 1989, Ser. No. 393,575

Int. Cl.[5] A01K *63/02, 1/03*

U.S. Cl. 119—5 **4 Claims**



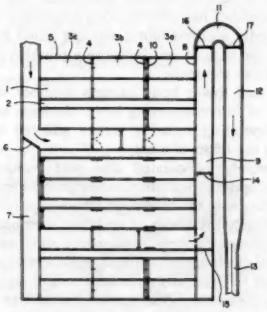
1. An adjustable cover for use with an animal tank or the like of several sizes, each of said tanks having an open top provided with edge portions having an exterior lip, said cover comprising two telescoping rectilinear tray-like sections each having a screen peripherally surrounded by a unitary flat frame member and depending skirt formed along three of the sides of each of the frame members, each of said tray-like sections being identical with one of said trays being narrower in the transverse direction, each of said trays having a flat rib extending transversely between the longitudinally extending portions of the frame members said flat rib being spaced from the open side, each of said flat rib and the portion of the frame member along the open side, having a row of holes formed therein, each row extending transversely to the direction of telescoping of said trays, at least some of the holes in one row of each tray being aligned with some of the holes in a row in the other of said trays along a line parallel to the direction of telescoping of said trays, so that the holes in one of the trays register with the aligned holes in the other tray, said cover including fastening means for insertion into the registered holes for securing said trays together in a selected one of at least two predetermined telescoping positions, the cross section of said secured tray defining a horizontal wall adapted to rest upon the top of said tank and a continuous peripheral wall adapted to fit about the exterior lip wherein each of the frames comprises a rectangular border having transverse and longitudinal reinforcing ribs.

5,009,191

SYSTEM FOR THE STALLING OF ANIMALS

Tage W. Joergensen, Copenhagen, and Leif Christensen, Vaerloese, both of Denmark, assignors to Slagteriernes Forskningsinstitut, Denmark

Filed Sep. 27, 1989, Ser. No. 413,340
Int. Cl.[5] A01K *1/02*
U.S. Cl. 119—20 7 Claims



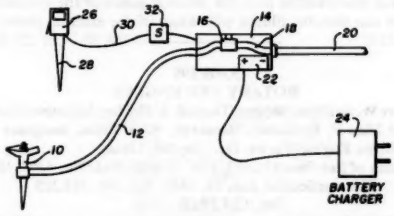
1. System for the stalling of animals, said system comprising: partition means for defining a driving-in passage, a driving-out passings, an elongate pen disposed between said passages, a pen entrance for communication between said pen and said driving-in passage, and a pen exit for communication between said pen and said driving-out passage; an entrance gate for opening and closing said pen entrance; an exit gate for opening and closing said pen exit; a driving gate movable longitudinally of said pen; and at least one stationary intermediate gate disposed in said pen at a predetermined distance from said entrance gate and said exit gate to divide said pen into a plurality of sections of predetermined size; said driving gate and said stationary intermediate gate extending transversely of said pen from one side of the pen to the opposite side.

5,009,192

ANIMAL DETERRENT APPARATUS

Barry A. Burman, RR #6, 592 Cheryl Place, Victoria, B.C., Canada U8X 3X2

Filed Sep. 18, 1990, Ser. No. 584,237
Int. Cl.[5] A01K *15/00*
U.S. Cl. 119—29 10 Claims



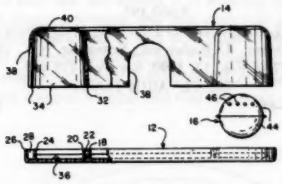
1. An apparatus to deter animals comprising in combination:
a water sprinkler with connection line to a water supply,
a low voltage electrically operated shut-off valve in the connection line,
low voltage power supply means for the shut-off valve, and
infrared proximity sensor for sensing a presence, the sensor powered by the power supply means, adapted to open the shut-off valve in the connection line to the sprinkler when the sensor senses a presence.

5,009,193

CIRCULAR CAT TOY

Richard A. Gordon, 95 W. 3rd St., Freeport, N.Y. 11520

Filed Sep. 27, 1989, Ser. No. 413,162
Int. Cl.[5] A01K *15/02*; A63H *33/00*
U.S. Cl. 119—29 5 Claims



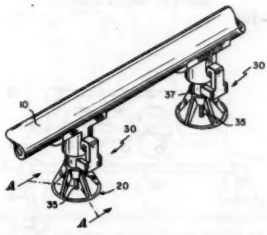
1. An animal plaything comprising a torroidal housing defining an enclosed circular raceway and a hollow ball freely movable in said raceway, said housing having a bottom surface adapted to rest on a planar, substantially horizontal surface, an upper surface, and inner and outer side walls, the inner side wall being continuous, the upper surface being provided with a plurality of substantially oblong openings permitting entry of the animal's paw but preventing passage of the ball therethrough, said oblong opening being sufficiently elongated to permit the animal to manipulate the ball over an extended arc, said outer wall being provided with a plurality of circumferentially spaced portal openings, all but at least one permitting entry of the animal's paw but preventing passage of the ball, said at least one portal opening also permitting passage of said ball for its removal, said ball being porous and being filled with an attractive lure for the animal, said oblong openings and portal openings being arranged in uniformly-spaced, alternating position about the center of said torroidal housing to permit said animal to manipulate said ball from opening to opening and cause its removal from only said at least one portal opening through entry of its paw in a selected one of the adjacent oblong openings.

5,009,194

DRINKER SHIELD

Eldon Hostetler, Middlebury, Ind., assignor to Ziggity Systems, Inc., Middlebury, Ind.

Continuation of Ser. No. 149,404, Jan. 28, 1988, abandoned. This application Jan. 19, 1990, Ser. No. 469,735
Int. Cl.[5] A01K *7/00*
U.S. Cl. 119—72 15 Claims



1. A shield apparatus attached to a trigger drinker watering unit with a trigger pin and a base portion, comprising:
a partially open shield surrounding said trigger pin such that said trigger pin is protected from inadvertent lateral activation by an animal;
said partially open shield surrounding said trigger pin and extending radially outward from said base portion of said trigger drinker water unit;
said partially open shield having a top portion and a bottom portion;

said bottom portion of said partially open shield located below or level with a bottom portion of said trigger pin when said trigger pin is in a substantially open position; and

a connection means for attaching said shield apparatus to said trigger drinker watering unit.

5,009,195

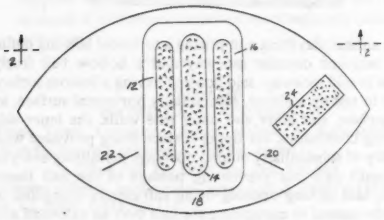
ANIMAL GROOMING DEVICE AND PROCESS

Hiltraut M. Damm, 42 Butler Rd., Scarsdale, N.Y. 10583

Filed Feb. 12, 1990, Ser. No. 478,463

Int. Cl.[5] A01K *13/00*

U.S. Cl. 119—86 **10 Claims**



1. A device for grooming the coat of fur-bearing animals which comprises a substrate sheet of pliable material having dimensions suitable for snugly enfolding the human hand, said substrate sheet having affixed thereto on at least one of its surfaces a plurality of bristles, the shafts of which are nominally perpendicular to said surface and at least some of said bristles having a hooked configuration, said bristles being positioned on said substrate in a manner such that they can be brought into contact with an animal's coat by pressing said substrate sheet against the animal using the palm or fingers of a hand enfolded therein, said substrate sheet having a fastening means to maintain it in snug enfoldment of a human hand, and containing at least one aperture through which the thumb of said human hand can protude while said hand is enfolded in said substrate sheet with the bristles covering the palm area.

5,009,196

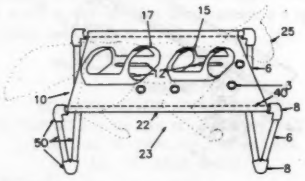
CAT RESTRAINER

Ruby Y. Young, P.O. Box 1094, Kerrville, Tex. 78029

Continuation-in-part of Ser. No. 238,493, Aug. 31, 1988, abandoned. This application Dec. 1, 1989, Ser. No. 449,505

Int. Cl.[5] A61D *3/00*

U.S. Cl. 119—101 **5 Claims**



1. A cat restraining apparatus comprising the combination of a harness apparatus and frame assembly for securing and supporting cats and other small domestic four legged pets for bathing, treating, breeding, transporting and surgical procedures, wherein the combination comprises:

a harness apparatus unit including a base member having four leg openings and supported horizontally on the frame assembly and, wherein the base member is composed of a durable, and flexible sheet of material with its longitudinal edge portions attached to longitudinal members of the frame assembly;

the harness apparatus wherein said base member is generally rectangular and of sufficient size to accommodate four leg openings for a cat or other small animal;

the harness apparatus wherein an upper and lower body harness member is fixedly secured to said base member and further includes a pair of openings that receive the legs of an animal;

the harness apparatus wherein said upper and lower body harness member has a lower body encircling element and has a fixedly secured fabric support panel member provided at the base of and between a plurality of interconnecting strap elements;

said upper and lower body harness member wherein said plurality of interconnecting strap elements are provided with cooperating securing means adapted to captively surround the torso of a cat;

a frame assembly associated with said harness apparatus including upper longitudinal side members approximately the length of said base member, lower transverse members approximately the width of said base member, and a plurality of elongated support members: of equal length;

the plurality of elongated support members of equal length and means to detachably connect said elongated support members to said longitudinal side members and to said transverse members normally, or at right angles.

5,009,197

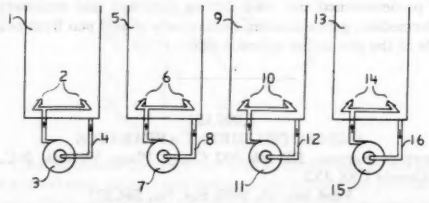
METHOD OF REMOVING OIL FROM BIRDS AND ANIMALS

Eric C. Cottell, Windermere, Private Dr., Bayville, N.Y. 11709

Filed Aug. 15, 1990, Ser. No. 567,629

Int. Cl.[5] A61D *11/00;* **A01K** *29/00*

U.S. Cl. 119—159 **3 Claims**



1. A method of cleaning a contaminated animal by adding a diluent of similar nature to the contaminant then either directly, or by stages, inverting the diluent so that it becomes the internal phase rather than the external phase of the emulsion, which can then be diluted with more of the external phase.

5,009,198

ROTARY VEE ENGINE

Robert W. Sullivan, Snyder; Tommie J. Holder, Mountain Park, and Max F. Buchanan, Roosevelt, all of Okla., assignors to Sullivan Engine Works, Inc., Snyder, Okla.

Division of Ser. No. 151,657, Feb. 3, 1988, Pat. No. 4,867,107. This application Jun. 28, 1989, Ser. No. 373,215

Int. Cl.[5] F02B *57/06*

U.S. Cl. 123—43 A **8 Claims**

1. In a rotary vee engine:

a housing having outer ends;

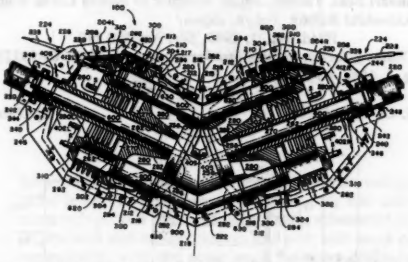
two cylinder blocks each having inner and outer ends and mounted in the housing for rotation of one cylinder block about a first rotational axis and rotation of the other cylinder block about a second rotational axis, said axes being angled to intersect adjacent the inner ends of said blocks at an included angle less than one hundred and eighty degrees;

each cylinder block having a plurality of cylinders formed therein to intersect the inner end of the cylinder block and to extend therefrom into the cylinder block parallel to the rotational axis of the cylinder block;

a plurality of angled pistons each having a portion disposed in a cylinder of one block and a portion disposed in a cylinder in the other block for orbital motion of the pistons coordinately with the rotation of the cylinder blocks;

a central bore formed through each of the cylinder blocks along the rotational axis for the respective cylinder block;

an angled support shaft extending through the central bores of each cylinder block, the support shaft having portions supported by the housing and including means for rotatably and axially supporting each of the cylinder blocks on the support shaft;



a generally bent axis cylindrical wedge shaped central cavity formed by the housing between the inner ends of the cylinder blocks for receiving air/fuel mixture during the operation of the engine;

an exhaust cavity formed by the housing axially outwardly from the central cavity adjacent each cylinder block for receiving and discharging the exhaust gases created during the operation of the engine;

a cooling air cavity formed by the housing adjacent the outer ends of each cylinder block including a torus shaped chamber expanding in volume radially outwardly from the rotational axis of the adjacent cylinder block and terminating in a cooling air discharge port; and

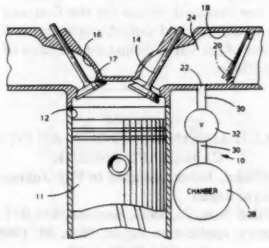
cooling air intake means defined in the outer ends of the housing in fluid communication with the adjacent cooling air cavity.

5,009,199

INTAKE RESERVOIR FOR AN ENGINE HAVING A CHECK VALVE

Glen R. MacFarlane, Clarkston, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jun. 8, 1990, Ser. No. 535,000
Int. Cl.[5] F02M *35/10*
U.S. Cl. 123—52 MF **3 Claims**



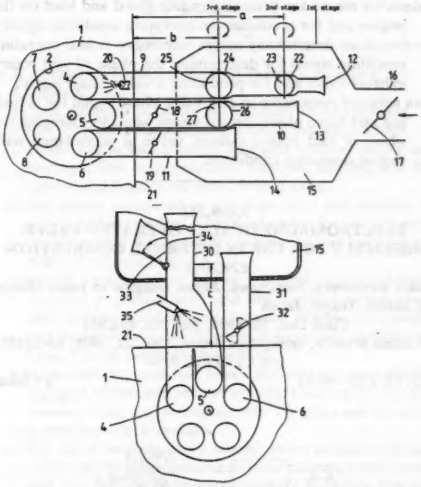
1. An intake reservoir for an engine having an intake passage leading to a cylinder, a check valve in the intake passage to allow fluid flow toward the cylinder and obstruct fluid backflow in the reverse direction, an intake valve seated in the intake passage between the check valve and cylinder, and a bypass port located on the intake passage so that the bypass port communicates with a trapped volume defined by the portion of the intake passage between the check valve and intake valve, the intake reservoir comprising a reservoir cavity having a single cavity port, a port passage connected between said cavity port and the bypass port enabling fluid flow between the trapped volume and said reservoir cavity, and a control valve connected to said port passage enabling active adjustment of the flow area of said port passage throughout a range of engine operating conditions to regulate fluid flow between the trapped volume and said reservoir cavity.

5,009,200

INTAKE MANIFOLD ASSEMBLY FOR A MULTICYLINDER INTERNAL COMBUSTION ENGINE

Richard van Basshuysen, Bad Wimpfen, and Armin Bauder, Neckarsulm, both of Fed. Rep. of Germany, assignors to Audi AG, Ingolstadt, Fed. Rep. of Germany

Filed Mar. 16, 1990, Ser. No. 495,287
Claims priority, application Fed. Rep. of Germany, Mar. 25, 1989, 3909837
Int. Cl.[5] F02M *35/10*
U.S. Cl. 123—52 M **10 Claims**



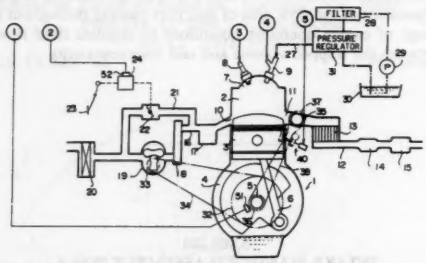
1. An intake manifold assembly for a multicylinder internal combustion engine having at least two inlet valves per cylinder, said assembly comprising longer and shorter length individual intake manifolds for each cylinder, each said manifold serving a respective inlet valve, each said shorter intake manifold having a control valve therein, said assembly characterized in that the effective length of each said longer individual intake manifold can be shortened to the length of the shorter individual intake manifold serving the same cylinder when the control valve is open allowing flow through the shorter intake manifold.

5,009,201

TWO-CYCLE ENGINE HAVING A DIRECT FUEL INJECTION SYSTEM

Koji Morikawa, Tokyo, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 3, 1990, Ser. No. 547,863
Claims priority, application Japan, Jul. 29, 1989, 1-199135
Int. Cl.[5] F02B *33/00*
U.S. Cl. 123—65 BA 3 Claims



1. A two-cycle engine having at least one cylinder, a scavenge port, an exhaust port, an intake passage communicated with said scavenge port, an exhaust passage communicated with said exhaust port, a scavenge pump provided in said exhaust passage, a rotary exhaust valve provided in said exhaust passage, means for rotating said scavenge pump and said rotary exhaust valve respectively, and a fuel injector provided for injecting fuel directly in the cylinder, the engine comprising:

valve phase control means for changing a phase of said rotary exhaust valve;

detector means for detecting engine speed and load on the engine and for producing an operating condition signal;

valve phase determining means responsive to said operating condition signal for determining the phase of said rotary exhaust valve and for producing a valve phase signal;

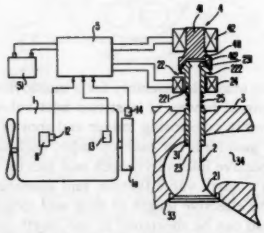
an actuator responsive to said valve phase signal for actuating said valve phase control means whereby changing the phase of said rotary exhaust valve in accordance with engine operating conditions.

5,009,202

ELECTROMAGNETICALLY OPERATED VALVE ASSEMBLY FOR USE IN INTERNAL COMBUSTION ENGINE

Hideo Kawamura, Samukawa, Japan, assignor to Isuzu Motors Limited, Tokyo, Japan

Filed Dec. 18, 1989, Ser. No. 452,041
Claims priority, application Japan, Dec. 22, 1988, 63-324301
Int. Cl.[5] F01L *9/04*
U.S. Cl. 123—90.11 2 Claims



1. An electromagnetically operated valve assembly for selectively opening and closing a port communicating with a cylinder in an internal combustion engine, comprising:

a valve made of a ceramic material, for selectively opening and closing the port, said valve including a stem;

a movable member mounted on an end of said stem and having a frustoconical flange portion on an end thereof, said movable member being made of a magnetic material;

a first coil disposed around said movable member;

a fixed member disposed in confronting relation to said movable member and having a recessed portion complementary in shape to said frustoconical flange portion, said fixed member being made of a magnetic material; and

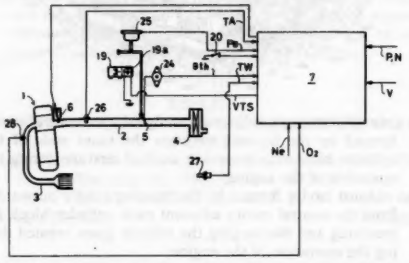
a second coil disposed around said fixed member.

5,009,203

CONTROL METHOD FOR VALVE-TIMING CHANGEOVER IN ENGINE

Yasunari Seki, Tochigi, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 1, 1989, Ser. No. 388,170
Claims priority, application Japan, Aug. 1, 1988, 63-192239; Aug. 1, 1988, 63-192241
Int. Cl.[5] F01L *1/34*
U.S. Cl. 123—90.16 6 Claims



1. A control method for valve-timing changeover in an engine in which the engine is an electronically controlled fuel injection type, valve timing for at least one of either the intake valves or the exhaust valves can be changed over between a low-speed valve timing suitable for a low-speed revolution range of the engine and a high-speed valve timing suitable for a high-speed revolution range of the engine, said method comprising the steps of:

establishing two sets of fuel injection quantities for selected operating conditions of the engine, one set of which are first fuel injection quantities suitable for the low-speed valve timing and the other set of which are second fuel injection quantities suitable for the high-speed valve timing;

detecting the selected operating conditions of the engine;

obtaining a value of the first fuel injection quantity from the one set and a value of the second fuel injection quantity from the other set for the detected operating conditions of the engine; and

comparing the obtained values for the first and second fuel injection quantities and outputting a signal for causing a changeover of the valve timing on the basis of the result of the comparison.

5,009,204

SPARK PLUG ARRANGEMENT IN AN OVERHEAD CAMSHAFT ENGINE

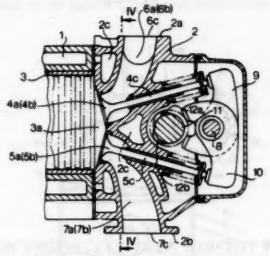
Norio Ishii, Mitaka, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 24, 1989, Ser. No. 441,077
Claims priority, application Japan, Nov. 30, 1988, 63-303381
Int. Cl.[5] F02F *1/32*
U.S. Cl. 123—193 H 1 Claim

1. In a spark plug arrangement in a single overhead camshaft engine having a cylinder head, two intake valves partially in

two intake ports and two exhaust valves at each cylinder provided in the cylinder head and only one overhead camshaft rotatably mounted in the cylinder head intersecting an extension of a center axis of said cylinder and disposed in a space between the intake valves and the exhaust valves for actuating said intake and exhaust valves by rocker arms, the improvement in the arrangement comprising:

a spark plug mounted in a plug hole in said cylinder head provided between said two intake valves and along and between said intake ports said spark plug defining an angle



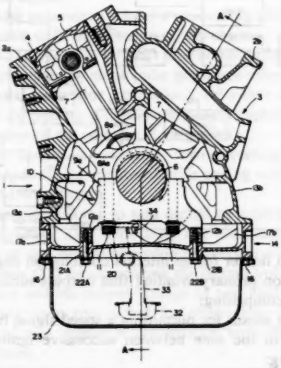
between said exhaust valves with said intake valves located in said angle between said spark plug and said exhaust valves, said intake valves defining substantial acute angles with said exhaust valves and with said spark plug, respectively, with the acute angle between said exhaust valves and said intake valves being larger than the acute angle between said spark plug and said intake valves, the spark plug and the plug hole being arranged so that a center electrode of the spark plug is positioned at said center axis with minimum inclination angle between said valves.

5,009,205

CRANKSHAFT SUPPORTING STRUCTURE FOR AN INTERNAL COMBUSTION ENGINE

Ryoji Abe, Hiroshima; Junichi Okita, Iwakuni; Katsunobu Miyagoshi, Miyagoshi, and Kouichi Hashiyama, Hiroshima, all of Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Nov. 8, 1989, Ser. No. 432,998
Claims priority, application Japan, Nov. 9, 1988, 63-282965
Int. Cl.[5] F02F *7/00*
U.S. Cl. 123—195 H **20 Claims**



1. A crankshaft supporting structure for a multi-cylinder engine comprising:

a plurality of bulkheads provided in a cylinder block of the engine to be arranged along an axis of a crankshaft disposed in a lower part of the cylinder block;

a bearing cap member having a plurality of bearing cap portions each coupled with a lower end of one of the bulkheads so as to form a bearing portion for supporting the crankshaft in conjunction with the bulkhead, and a pair of beam, portions extending along the axis of the crankshaft to interconnect two adjacent bearing cap portions;

a reinforcement member having a side wall portion coupled with a portion of the cylinder block;

a plurality of bolt seats located underneath the beam portions of the bearing cap member;

a plurality of ribs interconnecting one of the bolt seats and the side wall portions; and

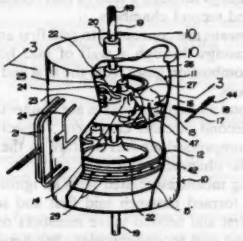
a plurality of bolts each fastening the beam portions and the bolt seats to the cylinder block.

5,009,206

ROTARY INTERNAL COMBUSTION ENGINE

Chong S. Yi, 40-15 79st #4D, Elmhurst, N.Y. 11373

Filed Nov. 16, 1989, Ser. No. 436,610
Int. Cl.[5] F02B *53/00*
U.S. Cl. 123—248 **17 Claims**



1. A rotary internal combustion engine comprising:

a housing,

an axle mounted to rotate in the center of said housing,

a first toroidal casing having a first circular chamber disposed within said housing, said first toroidal casing containing a first rotor rotatably disposed therein, said first rotor being fixedly mounted to said axle,

a first piston connected to said first rotor and slidably engaged within said first circular chamber for slidably moving along said first circular chamber and including a plurality of oil conduits,

a second toroidal casing having a second circular chamber disposed in parallel with said first toroidal casing within said housing, said second toroidal casing containing a second rotor rotatably disposed therein, said second rotor being fixedly mounted to said axle,

a second piston connected to said second rotor and slidably engaged within said second circular chamber for slidably moving along said second circular chamber and including a plurality of oil conduits,

a first valve member and a second valve member disposed within said first and second toroidal casings, respectively, said first and second valve members including first and second valve doors with a pair of gas-exhausting apertures which are adapted to open or close so as to permit or prevent the piston from passing, respectively,

a first valve plate fixedly mounted to said axle and disposed in parallel with said first toroidal casing within the housing, said first valve plate having a peripheral edge portion and an extended edge portion for operatively guiding the rotation of a first valve roller therealong, said first valve roller being connected to said first valve doors through a first connecting member,

a pair of first magnetic members operatively associated with said first valve member and disposed in opposite side to

each other about the first valve member within the housing, said pair of first magnetic members having a first up and down rod with a first closure for operatively opening and closing said pair of gas-exhausting apertures, respectively,

a second valve plate fixedly mounted to said axle and disposed in parallel with said second toroidal casing within the housing, said second valve plate having a peripheral edge portion and an extended edge portion for operatively guiding the rotation of a second valve roller therealong, said second valve roller being connected to said second valve doors through a second connecting member,

a pair of second magnetic members operatively associated with said second valve member and disposed in opposite side to each other about the second valve member within the housing, said pair of second magnetic members having second up and down rod with a second closure for operatively opening and closing said pair of gas-exhausting apertures, respectively,

a first auxiliary roller and a second auxiliary roller for operatively rotating along said first and second valve roller and connecting said first and second magnetic members through a electric wire, respectively so as to make the magnetic member activate and open and close the first and second valve doors,

refrigeration means are connected to said first and second toroidal casings through a wall of said housing for cooling the first and second chambers,

connecting means are connected to said first and said second toroidal casings through a wall of said housing for exhausting combustion gases from the first and second circular chambers,

first and second air and gas intakes are connected to said first and said second circular chambers, respectively for supplying a compressed air-fuel mixture to the first and second circular chambers, and

spark forming means associated with an ignition and explosion zone formed between said first and second pistons and said first and second valve members respectively, in said first and said second circular chambers, whereby the rotation of the rotor within the internal combustion engine is achieved by continuously transferring the compressed air-fuel mixture to the ignition and explosion zone in a closed valve door position, igniting and simultaneously exploding the mixture continuously, and continuously exhausting the gases of combustion in the closed valve door position and thereafter, the piston passes through the valve doors in an open valve door position and simultaneously, the gases of combustion do not exhaust, whereby rotation of the rotors together with the axle is achieved.

5,009,207

INTERNAL COMBUSTION ENGINE

Dan Merritt, 139 Baginton Road, Coventry, England

Filed May 5, 1989, Ser. No. 347,821

Claims priority, application United Kingdom, May 7, 1988, 8810871; Apr. 24, 1989, 8909185

Int. Cl.[5] F02B *19/00*

U.S. Cl. 123—261 **39 Claims**

1. An internal combustion engine comprising at least one pair of first and second cylinders, said first cylinder having a larger swept volume than said second cylinder;

a combustion chamber communicating with said cylinders;

first means for delivering a charge of substantially air into said first cylinder;

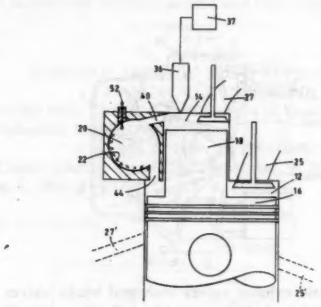
second means for delivering a charge of liquid fuel into said second cylinder;

respective first and second pistons movable in said cylinders;

continually operable ignition means in said combustion chamber;

control means for controlling said second means to commence delivery of said charge of fuel into said second cylinder during movement of said second piston between a first position wherein said piston is at the commencement of its induction stroke and a second position wherein said piston is not less than 10° angle of movement from the end of its compression stroke and to terminate delivery of said charge of fuel when said second piston reaches a third position no later than the inner dead centre position of the piston at the end of the compression stroke; and

means for inhibiting movement of fuel/air mixture from said second cylinder into said combustion chamber prior to



said second piston reaching a fourth position wherein said piston has completed at least substantially 80% of its compression stroke length and means for inducing a vortex motion in air delivered to said combustion chamber from said first cylinder for assisting rapid mixing in said combustion chamber of fuel/air mixture from said second cylinder and air from said first cylinder during combustion.

5,009,208

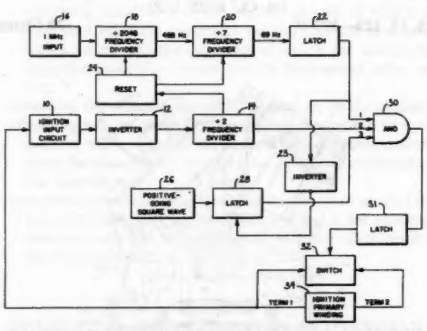
ENGINE SPEED LIMITER

John A. Fiorenza, II, Slinger, Wis., assignor to Briggs & Stratton Corporation, Wauwatosa, Wis.

Continuation of Ser. No. 482,006, Feb. 15, 1990, abandoned. This application Aug. 14, 1990, Ser. No. 568,654

Int. Cl.[5] F02P *5/15*

U.S. Cl. 123—335 **14 Claims**



7. A speed limiter for an internal combustion engine which has an ignition primary winding that outputs successive ignition pulses, comprising:

computing means for outputting a speed signal functionally related to the time between successive ignition pulses, including:

determining means for outputting a frequency signal functionally related to the frequency of ignition pulses;

first frequency divider means for frequency dividing said

frequency signal and for outputting a divided frequency signal;

generating means for generating a reference signal functionally related to a maximum limit speed including:

input means for receiving a clock signal;

means for deriving said reference signal from said clock signal and for outputting said reference signal; and

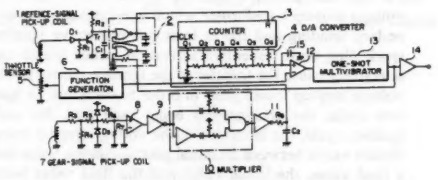
comparison means for comparing said speed signal with said reference signal and for generating a limit signal if the result of said comparison indicates that the engine speed is about equal to or greater than said maximum limit speed.

5,009,209

IGNITION TIMING CONTROL CIRCUIT FOR AN INTERNAL COMBUSTION ENGINE

Hiroshi Okuda, and Masayuki Ozawa, both of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 7, 1990, Ser. No. 476,231
Int. Cl.[5] F02P *5/155*
U.S. Cl. 123—415 **13 Claims**



1. An ignition timing control circuit for an internal combustion engine, comprising:

a load sensor (**5,6**) for sensing the load condition of said engine and generating an output signal representative of the sensed load condition;

reference-signal generating means (**1,2**) for generating a reference signal;

a clock pulse generator (**7–11**) for generating clock pulses in accordance with the rotation of the engine;

a counter (**3**) operable to start the counting of the clock pulses generated by clock pulse generator when said reference-signal generator generates a reference signal, said counter outputting a digitalized output representative of the number of the counter clock pulses;

a digital to analog converter (**4**) for converting the digitalized output of said counter into an analog voltage having a stepped waveform;

an integrator connector to said digital to analog converter for integrating and smoothing out the stepped output voltage of said digital to analog converter; and

a comparator (**12**) for comparing the output voltage of said integrator and the output voltage of said load sensor and generating an output signal for controlling the ignition timing of said engine in accordance with the result of comparison,

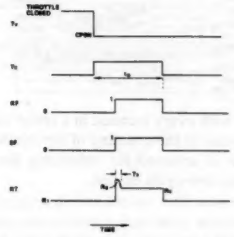
wherein said integrator comprises a capacitor (**15**) having a fixed time constant, and wherein said capacitor has one terminal coupled to the output terminal of said digital to analog converter and the other terminal grounded.

5,009,210

AIR/FUEL RATIO FEEDBACK CONTROL SYSTEM FOR LEAN COMBUSTION ENGINE

Toyoaki Nakagawa; Hiroshi Sanbuichi, both of Yokohama; Katsunori Terasaka, Yokosuka, and Makoto Saito, Yokohama, all of Japan, assignors to Nissan Motor Co., Ltd., Japan

Filed Jan. 7, 1987, Ser. No. 1,328
Claims priority, application Japan, Jan. 10, 1986, 61-3199
Int. Cl.[5] F02D *41/14, 41/10*
U.S. Cl. 123—489 **9 Claims**



1. A control system for feedback control of the air/fuel ratio of an air-fuel mixture supplied to an internal combustion engine which uses a three-way catalyst for purifying the exhaust gas, the control system comprising:

air/fuel ratio detection means for detecting actual values of air/fuel ratio in the engine;

load detection means for detecting the load under which the engine is operating;

transient condition detection means for detecting any of predetermined transient operating conditions of the engine; and

control means for performing feedback control of the feed of fuel or air to the engine based on the detected actual values of air/fuel ratio, the control means comprising target value setting means for determining the target value of the air/fuel ratio according to information obtained by said load detection means and said transient condition detection means such that the target value becomes a first value which is higher than the stoichiometric air/fuel ratio at least during predetermined steady-state operation of the engine and shifts to a second value which is optimum for the activities of the three-way catalyst when any of said predetermined transient operating conditions is detected and modulation means for regulating the feed of fuel or air to the engine at the start of the shift of the target value such that the air/fuel ratio deviates from said second value in the direction reverse to the target value immediately before the shift only for a predetermined period of time.

5,009,211

FUEL INJECTION CONTROLLING DEVICE FOR TWO-CYCLE ENGINE

Kazumitsu Kushida, Tokyo; Osamu Kudou, Saitama; Sumitaka Ogawa, Saitama, and Hiroshi Uike, Saitama, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

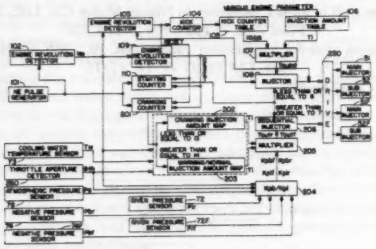
Division of Ser. No. 448,529, Dec. 11, 1989. This application Aug. 31, 1990, Ser. No. 575,616
Claims priority, application Japan, Feb. 23, 1989, 1-41825
Int. Cl.[5] F02D *41/06*
U.S. Cl. 123—491 **4 Claims**

1. A fuel injection control apparatus for a two-cycle engine including an electronic type fuel injection apparatus comprising:

a kick starter for actuating the electronic type fuel injection apparatus;

counter means for counting the number of times the kick starter is actuated; and

means for sequentially reducing fuel injection to the two-cycle engine with every increase in a count value representing an increase in the counting of the number of times the kick starter is actuated for enhancing the possibility of firing of the two-cycle engine.



5,009,212

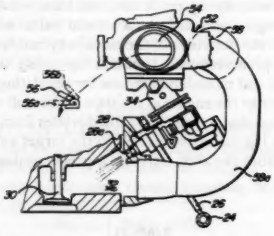
PORT FUEL INJECTION AND INDUCTION SYSTEM FOR INTERNAL COMBUSTION ENGINE

Macram N. Bishai, Windham, N.H., assignor to McCord Winn Textron Inc., Winchester, Mass.

Filed Jan. 17, 1990, Ser. No. 466,587

Int. Cl.[5] F02M *23/00*

U.S. Cl. 123—533 **10 Claims**



1. An engine having a valve cover with a PCV valve to vent a valve chamber so as to eliminate oil and gas fumes therefrom and an automotive fuel injection system having a port fuel injector connected to a fuel supply and to an air manifold for injecting an air/fuel mixture into the injector for producing a fuel spray pattern at the outlet of an air induction passage from a throttle body assembly and upstream of an inlet valve to the combustion chamber of an internal combustion engine characterized by an integral electric motor driven pump assembly means supplying the injection air to the air manifold; said motor pump assembly means having a pump inlet connected to said PVC valve for providing a lubrication mist to said pump during the operation thereof and said motor pump assembly means having a pump outlet connected to the inlet of said air manifold.

5,009,213

STATIC IGNITION DEVICE FOR INTERNAL COMBUSTION ENGINES

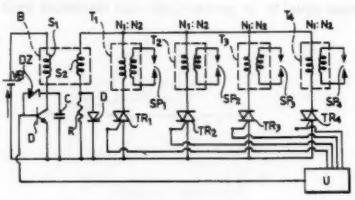
Vittorio Di Nunzio; Eraldo Giaccardi, both of Turin, and Sergio Saluzzo, San Pietro Val, all of Italy, assignors to Fiat Auto S.p.A., Turin, Italy

Filed Feb. 13, 1990, Ser. No. 479,806

Claims priority, application Italy, Feb. 13, 1989, 67084 A/89

Int. Cl.[5] F02P *3/04*

U.S. Cl. 123—620 **9 Claims**



1. In an ignition device for internal combustion engines, including:

mutual impedance means with a primary winding and a secondary winding with a given ratio of turns, the secondary winding being intended to supply at least one ignition branch circuit having at least one ignition spark plug.

excitation means for storing a given ignition energy in the primary winding and for the rhythmic transfer of the energy to the secondary winding, the improvement wherein:

said given ratio of turns is selected substantially unitary,

the at least one ignition branch circuit includes a respective voltage step-up transformer which acts between the secondary winding and the at least one respective ignition spark plug with respective activation means which can selectively cause the transfer of the ignition energy to the voltage step-up transformer in order to carry out an ignition cycle, the arrangement being such that, for each ignition cycle, the induction in the voltage step-up transformer varies between an initial prepolarisation value and a final value, the initial value and the final value being approximately identical in value but opposite in sign, and

a resistor for limiting the prepolarisation current in the at least one voltage step-up transformer to its initial value is interposed between the secondary winding and the at least one ignition branch circuit.

5,009,214

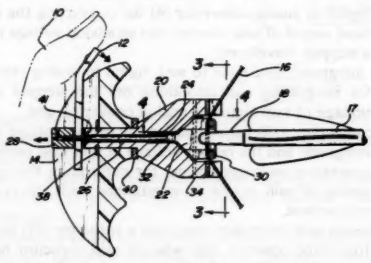
HOLDING AND RELEASE MECHANISM

James Wilde, 2022 Stephens Rd., Prudenville, Mich. 48651

Filed Oct. 27, 1989, Ser. No. 427,555

Int. Cl.[5] F41B *5/00*; A01K *27/00*

U.S. Cl. 124—35.2 **5 Claims**



1. A holding and release mechanism comprising

A. dual yoke arms, said arms having slotted open ends to receive a flexible line or rigid rod;

B a swinging lever holding member attached between said yoke arms, said lever having dual rod-like extensions attached perpendicular to the plane of said lever and adapted to hold said line or rod within said slotted open ends of said yoke arms, said swinging lever holding member being attached to said yoke arms so as to allow said swinging lever to pivot between said yoke arms, and said swinging lever extending rearwardly so as to form a detent portion thereof;

C. a retaining rod slidably positioned in a bore formed in the closed ends of said yoke arms, said rod being urged forwardly by a coil spring engaging said rod on the circumference thereof, having a detent on the forward end thereof, and adapted to frictionally engage said detent portion of said holding member; and

D. a trigger acting upon said retaining rod so as to move said rod rearwardly and out of a detent position in which said swinging lever holding member is held in a detent position so as to retain said line or rod within said slotted portion of said yoke arms.

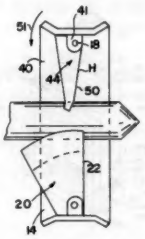
5. The article recited in claim 1 wherein said swinging holding member is adapted to receive a flexible line or rigid rod attached to an animal collar.

5,009,215

ARROW REST AND HOLDER APPARATUS

James E. Ludwig, 4063 Ensign Ave. North, Minneapolis, Minn. 55427

Filed Jul. 2, 1990, Ser. No. 552,796
Int. Cl.[5] F41B *5/00*
U.S. Cl. 124—44.5 **15 Claims**



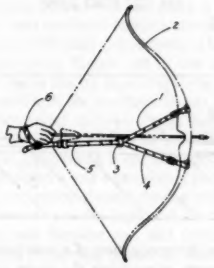
1. Arrow rest apparatus mountable on an archery bow having a bow handle and a bow string extending rearwardly of the bow handle for supporting an arrow having a shaft, vanes on the shaft and an arrow point when the arrow is in a strung non-drawn position and the arrow is moved to a fully drawn shooting position, comprising a mounting bracket having a transversely extending, generally horizontal leg, a transverse pivot mounted on the horizontal leg above the leg and having a transverse pivot axis, and a generally frusto-sector shaped swing arm having a base edge, leading and trailing edges intersecting with the base edge in longitudinal spaced relationship to one another to diverge in a generally radially outward direction away from the pivot, the intersection of the base and leading edges defining a swing arm corner portion mounted by the pivot for limited pivotal movement between a datum position and an arrow shooting position, and a generally arcuately extending edge extending between and intersecting with the leading and trailing edges radially outwardly of the base edge to provide an arrow shaft supporting surface, the supporting surface having a leading surface portion and a trailing surface portion that extends more closely adjacent to the pivot axis than the minimum spacing of the leading surface portion from the pivot axis.

5,009,216

BOW DRAW STOP

Lawrence M. Ross, 8708 Hwy. V, Caldonia, Wis. 53108

Filed Aug. 13, 1990, Ser. No. 566,840
Int. Cl.[5] E41R *5/00*
U.S. Cl. 124—88 **2 Claims**



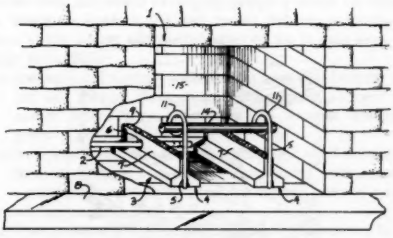
1. A draw stopping device for use with a bow having upper and lower limbs comprising a first strap which is removably attached to said upper limb of the bow on a first end a convenient distance from a central portion of the bow, a second strap which is removably attached to said lower limb of the bow on a first end a convenient distance from said central portion of the bow, a loop-shaped wrist strap which is removably attachable to an archer's wrist, and a third strap which is attached to the wrist strap on a first end, the first, second and third straps being joined on their second ends, the length of the first, second and third straps being such that a bow string may be drawn to a point which is approximately at the user's chin.

5,009,217

FIREPLACE LOG HOLDER AND ALARM

Hewitt M. Johnson, Rte. 2, Box 68, Lebo, Kans. 66856

Filed Apr. 9, 1990, Ser. No. 506,220
Int. Cl.[5] F23H *13/00;* **G08B** *3/02;* **G10K** *1/06*
U.S. Cl. 126—152 B **6 Claims**



1. A fireplace log holder and alarm comprising:

log support means adapted to extend from the front to the rear of a firebox;

a pair of laterally spaced uprights on a front portion of said log support means, and each having an upper end provided with an eye; and

a tubular member spanning the uprights and loosely received in said eyes of the uprights, whereby a falling log striking the uprights or the tubular member will cause the latter to strike the uprights within the eyes to generate a warning sound.

5,009,218

HEAT-INSULATING BUILDING AND/OR LIGHT ELEMENT

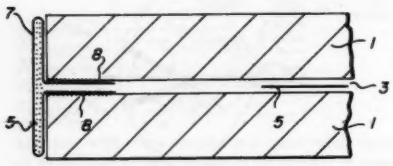
Emil Büchli, Marktgasse 7, CH-5304 Endigen, Switzerland

Division of Ser. No. 88,850, Jul. 22, 1987. This application Jun. 28, 1990, Ser. No. 545,038

Claims priority, application Switzerland, Nov. 29, 1985, 5091/85; Apr. 16, 1986, 1558/86; Sep. 18, 1986, 3737/86

Int. Cl.[5] F24J *2/00*

U.S. Cl. 126—452 **9 Claims**



1. A process for the production of a heat-insulating building and/or light element comprising the steps of positioning a plurality of flat support elements (2) between at least two substantially parallel wall elements (1) to space the wall elements a predetermined distance apart, applying a metallic foil seal to the edge areas of the spaced wall elements to form a tight bond therebetween so as to define an evacuable interspace (3) therebetween and to absorb any differences in expansion of the wall elements resulting from differences in the temperatures of the wall elements, evacuating the interspace to a vacuum between 1 and 10^{-2} mbar, the distance between the wall elements being smaller than the free path lengths of air molecules as determined for that vacuum such that the heat conductivity of the air molecules between the wall elements is substantially cancelled.

5,009,219

HEATING DEVICE

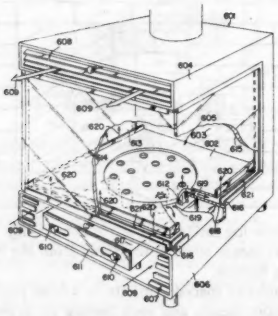
Fredericus Liet, HD Losser, Netherlands, assignor to Liets Agrarische Technieken B.V., HD Losser, Netherlands

Continuation-in-part of Ser. No. 273,046, Nov. 18, 1988, abandoned. This application Feb. 2, 1989, Ser. No. 473,107

Claims priority, application Netherlands, Nov. 20, 1987, 8702795; Dec. 3, 1987, 8072919; Jan. 15, 1988, 8800090; Jan. 15, 1988, 8800091; European Pat. Off., Jun. 17, 1988, 88.201.266.9

Int. Cl.[5] F24B *1/188*

U.S. Cl. 126—523 **10 Claims**



1. A heating device with a combustion space having at least one free side, said heating device comprising a substantially C-shaped heat exchanger open to the front for heating air, said heat exchanger being provided with a lower heat exchanger part on which solid fuel can be laid, said lower part connecting onto a standing heat exchanger part that in turn connects to an upper heat exchanger part such that said heat exchanger bounds said combustion space, characterized in that

the lower heat exchanger part further comprises a chamber in communication with outside air to be heated and having a wall adjoining the combustion space, through which chamber wall at least one substantially vertical channel extends connecting said combustion space with surrounding air for a supply of air, and

supporting means slidably carrying an ash pan having at least one aperture communicating with outside air, said supporting means comprising a compartment with an upper wall in communication with the at least one vertical channel whereby outside air is supplied via the at least one ash pan aperture to the combustion space, said compartment being positioned in the chamber of the lower heat exchanger part such that at least one passage is formed by the ash pan and a wall of the chamber whereby outside air communicating with the chamber is heated by the combustion space and flows at least partially around said compartment to the outside.

5,009,220

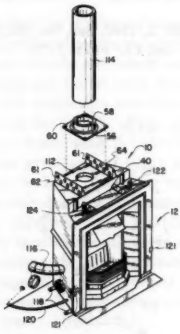
SAFETY ENCLOSURE FOR COAL, GAS OR WOOD-BURNING FIREPLACE

Peter B. Cornelison, Hiram, Ohio, assignor to Condar, Inc., Garrettsville, Ohio

Filed Nov. 22, 1989, Ser. No. 440,105

Int. Cl.[5] F24B *1/188*

U.S. Cl. 126—523 **12 Claims**



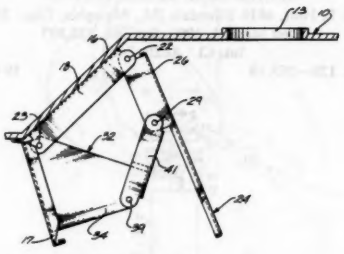
1. A reduced clearance system for a cast iron fireplace including a surround having a rectangular outer periphery, said system including a sheet metal box at least partially open at the front, having a trapezoidally shaped sheet metal base and sheet metal side walls vertically extending from each of the three shorter sides of the base, one of the side walls including near the bottom thereof an air inlet aperture, each of the three side walls having a generally horizontal outwardly projecting sheet metal spacer bar secured thereto for limiting the clearance of the system from adjacent building structure, the opposing side walls being stepped at the top to provide a recess in the top marginal edge, a first trapezoidally shaped top member for the higher step having an aperture therein adapted to accept a flue member, a pair of spaced spacer members secured to said first top member and extending in a direction normal to the front of said box, a second trapezoidally shaped top member for the lower step, a rectangularly shaped front member covering the riser portion of the step, the second trapezoidally shaped top member having at least a pair of spaced sheet metal spacer bars extending generally normal to the front member secured thereto, the front member also having spaced generally vertically extending sheet metal spacer bars secured thereto, and a pedestal supported in spaced relation to the sheet metal base for supporting the cast iron fireplace.

5,009,221

ADJUSTABLE LINTEL EXTENSION FOR A FIREPLACE

David O. Brazell, and J. Timothy French, both of Yorba Linda, Calif., assignors to Superior Fireplace Company, Fullerton, Calif.

Filed Jan. 19, 1990, Ser. No. 467,647
Int. Cl.[5] F24B *1/189*
U.S. Cl. 126—538 **7 Claims**



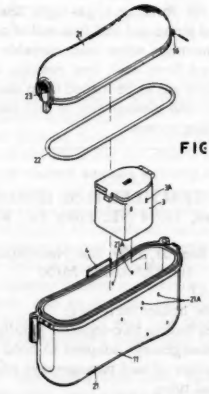
1. A pre-built fireplace comprising:
a frame having an outlet for combustion gases and an open front side for viewing the interior of the frame;
a damper movably secured to the frame between a first position allowing combustion gases to escape from the frame through the outlet and a second position substantially inhibiting the escape of gases through the outlet; and
a lintel extension movably secured to the frame and movably coupled to the damper such that movement of the damper to the first position simultaneously moves the lintel extension partially into the viewing area of the frame to inhibit the escape of combustion gases from the open front side and movement of the damper to the second position simultaneously moves the lintel extension to a position substantially out of the viewing area of the frame.

5,009,222

DIVING CASE MASSAGER

Ming-Long Her, No. 24, Alley 3, Lane 42, Sec. 2, Hsiang Shang Road, Taichung City, Taiwan

Filed Jul. 24, 1989, Ser. No. 383,591
Int. Cl.[5] A61H *1/00*
U.S. Cl. 128—36 **2 Claims**



FIG

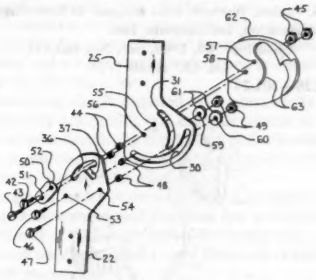
1. A diving case massager, including a vibrator having a housing with an outer wall surface and a slideway therein and a top edge and grooves bilaterally made in said outer wall surface thereof, a casing having an upper cover pivoted thereto to define an inner chamber for setting therein of said vibrator and comprising an adjustable strip with both ends adjustably connected to said casing for binding said casing to the user, wherein said casing comprises internally and bilaterally a plurality of tenons for respective insertion into said grooves so as to firmly retain said vibrator therein, and wherein said vibrator is comprised of said housing, a cover plate having two swing plates, each swing plate having a stub tenon, and front snap means, an eccentric motor, a holder plate, a battery set and a resilient washer, said eccentric motor and said battery set being mounted on said holder plate respectively at both sides thereof, said holder plate being further set in the slide way of said housing, said housing having an axle seat on said top edge and comprising an axial hole for insertion therein from both ends of said two stub tenons of the two swing plates of said cover plate, so as to let said cover plate be pivoted to said housing, said housing also comprising a circular scoop channel at the top around its periphery and a projecting portion beneath said scoop channel, said scoop channel having said resilient washer set therein to provide a water-tight seal when said cover plate is connected to said housing and said front snap means are engaged with said projecting portion of said housing.

5,009,223

VARIABLE AXIS KNEE BRACE

Michael A. DeFonce, 12149 Mirror Lake, Creve Coeur, Mo. 63146

Filed Oct. 2, 1989, Ser. No. 415,623
Int. Cl.[5] A61F *5/00*
U.S. Cl. 128—80 C **13 Claims**



1. A stabilizing mechanical hinge for use in a knee brace for simulating the functions of the articulating members in the human knee, said brace having leg grasping means for clasping the brace to wearer's leg and means defining a mechanical hinge at the lateral and medial sides of the human knee, said hinge comprising:
a femoral joint element including at least one femoral arcuate slot formed through said femor joint element with center of curvature located at the femoral attachment point of a cruciate ligament;
a tibial joint element including at least one tibial arcuate slot formed through said tibial joint element with center of curvature located at the tibial attachment point of a cruciate ligament;
at least one femoral pivot and bearing means carried by said femoral joint element, said femoral pivot and bearing means located at the center of curvature of said femoral arcuate slot and having a surface in bearing engagement with said tibial arcuate slot,
at least one tibial pivot and bearing means carried by said tibial joint element, said tibial pivot and bearing means located at the center of curvature of said tibial arcuate slot and having a surface in bearing engagement with said femoral arcuate slot;
thrust resisting means mounted to said femoral pivot and bearing means and confining said tibial joint element be-

tween said femoral joint element and said thrust resisting means; and

thrust resisting means mounted to said tibial pivot and bearing means and confining said femoral joint element between said tibial joint element and said thrust resisting means.

5,009,224

METHOD FOR ATTACHING A PRESSURE-SENSITIVE FILM ARTICLE HAVING HIGH MOISTURE VAPOR TRANSMISSION RATE

Susan M. Cole, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 266,201, Oct. 27, 1988, abandoned, which is a continuation of Ser. No. 913,688, Sep. 30, 1986, abandoned. This application Jul. 30, 1990, Ser. No. 561,247

Int. Cl.[5] **A61F** *13/00, 15/00;* **A61L** *15/00*

U.S. Cl. 128—156 **23 Claims**

2. A method of attaching a device or article to the skin comprising attaching said device or article to the skin with a pressure sensitive adhesive wherein said adhesive comprises a hydrophilic film which is continuous and liquid impermeable over its entire surface, said film having dispersed therein cellular voids containing a gaseous phase constituting at least 10 percent of the volume of said film, and a 0.76 mm thickness of said film having a moisture vapor transmission rate of at least about 400 g/m^2 per 24 hours at 40° C. and an 80 percent humidity differential.

5,009,225

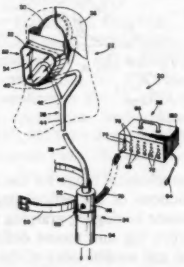
PERSONAL VENTILATING SYSTEM

William S. Vrabel, Warsaw, Ind., assignor to Boehringer Mannheim Corporation, Indianapolis, Ind.

Filed Nov. 30, 1989, Ser. No. 443,916

Int. Cl.[5] **A62B** *7/00*

U.S. Cl. 128—201.24 **4 Claims**



1. A personal ventilating system for use with a surgical hood enveloping at least the wearer's face and isolating from the surrounding atmosphere the breathing space proximate the wearer's nose and mouth, said system comprising:

inlet means for receiving air from the breathing space isolated by the surgical hood;

outlet means for exhausting to the surrounding atmosphere air flowing from said inlet means;

filter means intermediate said inlet means and said outlet means for removing impurities from the air drawn from the breathing space within the surgical hood;

adjustable flow inducing means including a fan and a variable speed d.c. motor for driving said fan operable for drawing air from the breathing space within the surgical hood and causing it to exhaust through said outlet means to the surrounding atmosphere; and

a first power source for operating said flow inducing means to achieve a desired flow rate including a d.c. power supply distant from the wearer and having a variable speed control for selectively varying the voltage being directed to said motor;

cord means selectively coupling said power supply and said motor;

a second power source for operating said flow inducing means including a battery; and

switch means for selectively energizing said motor either by said power supply or by said battery.

5,009,226

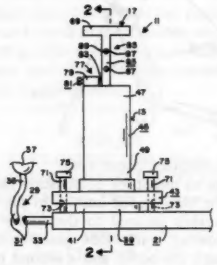
MECHANICAL RESUSCITATOR

William T. Holt, 4610 Ellendale Rd., Memphis, Tenn. 38135

Filed May 14, 1990, Ser. No. 523,897

Int. Cl.[5] **A62B** *7/00*

U.S. Cl. 128—205.18 **19 Claims**



1. A resuscitator for conveying gas to a patient's lungs, said resuscitator comprising:

(a) a pump having a cavity and including movable means movable between a first position and a second position for forcing gas from said cavity of said pump when moved from said first position to said second position and for drawing gas into said cavity of said pump when moved from said second position to said first position, said pump having an opening for allowing gas to be drawn into and forced out of said cavity thereof;

(b) a base member having a passageway for allowing gas to pass therethrough, said passageway having a first end and a second end;

(c) coupling means for allowing gas to pass from said passageway of said base member to said patient's lungs, said coupling means including a hollow tube for being connected to said second end of said passageway of said base member to allow gas to pass from said passageway of said base member therethrough; and

(d) seal means for forming a gas-tight seal between said opening of said pump and said first end of said passageway of said base member when said movable means of said pump is moved from said first position to said second position to allow gas to be forced from said cavity of said pump through said passageway of said base member and out said coupling means.

5,009,227

ENDOTRACHEAL TUBE HOLDER

Peter P. Nieuwstad, 12374 NE. 116th La., Kirkland, Wash. 98034

Filed Sep. 21, 1989, Ser. No. 410,429

Int. Cl.[5] **A61M** *16/00*

U.S. Cl. 128—207.17 **9 Claims**

1. A medical tube holder including:

a tubular member having two separate parallel passageways, one of said passageways adapted to hold a first medical tube and the other of said passageways adapted to hold a second medical tube;

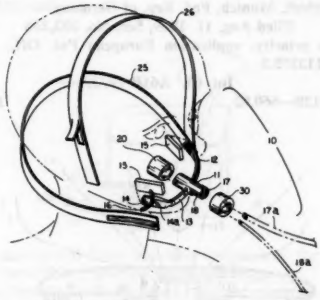
a removable sleeve collet disposed over said tubular member;

said sleeve collet having a partial inner annular ring member;

flanges disposed on opposite sides of said tubular member

engageable with said inner annular ring member on said sleeve collet to prevent the removal of said sleeve collet;

said tubular member having a circumferential groove for mating with said inner annular ring member on said sleeve collet to tighten said tubular member against said first



medical tube and hold it in position relative to said passageway adapted to hold said first medical tube; and

two flexible elongated side members disposed on either side of and extending away from said tubular member and adapted to attach said medical tube holder to the face of a wearer.

5,009,228

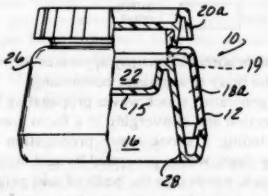
DEVICE FOR RELIEVING EAR PAIN

Frank L. Clark, 872 E. Napier, Benton Harbor, Mich. 49022

Continuation-in-part of Ser. No. 245,577, Sep. 19, 1988, abandoned, which is a continuation-in-part of Ser. No. 161,676, Feb. 29, 1988, abandoned. This application Jun. 26, 1989, Ser. No. 371,623

Int. Cl.[5] A61F *7/00*

U.S. Cl. 128—380 **14 Claims**



5. A device for use in conjunction with the outer ear and surrounding cranial base region of a patient for relieving inner ear pain, the device comprising:

a cup-shaped housing having an oval shape to conform to the shape of the outer ear for closely enclosing the outer ear, said cup-shaped housing defining a first ear enclosing interior chamber, said interior chamber having a first open end portion and a second base portion, said first open end portion configured to closely encompass the outer ear of the user, said cup-shaped housing further comprising inner and outer walls defining a second heat chamber therebetween, an opening formed in said outer wall at said second base portion, and an annular portion means, extending around the perimeter of said first open end portion, for tightly and comfortably contacting the side of a user's head;

a removable cap, engageable over, and in a water tight relationship with, said opening in said outer wall, and configured to provide a flat base for grasping when in use; and

a heat source within said second heat chamber for heating said first ear enclosing interior chamber and the inner ear of the user when said cup-shaped housing is placed over the outer ear.

5,009,229

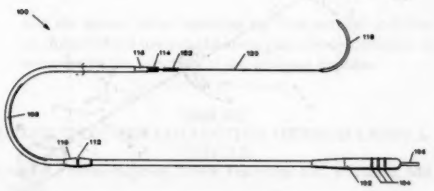
STEROID ELUTING INTRAMUSCULAR LEAD

Pierre-Andre Grandjean, Bassenge, Belgium, and Philip H. J. Lee, Woodbury, Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Filed Dec. 6, 1989, Ser. No. 446,594

Int. Cl.[5] A61N *1/05*

U.S. Cl. 128—419 P **6 Claims**



1. An apparatus for stimulating a skeletal muscle of a human patient surgically prepared to assist the heart of said human patient comprising:

a. implantable pulse generator means for generating pulses to stimulate said skeletal muscle in timed relation to said heart of said human patient;

b. a connector for electrically coupling said pulses from said implantable pulse generator;

c. at least one sealing ring coupled to said connector to seal said connector to said implantable pulse generator means;

d. an electrically conducting coil having a proximal end and a distal end wherein said proximal end is electrically coupled to said connector;

e. an insulating sheath disposed over substantially all of said electrically conducting coil except a portion at said distal end of said electrically conducting coil wherein said portion is sufficient to function as an electrode to couple said pulses to said skeletal muscle;

f. a length of suture material having a proximal end and a distal end wherein said proximal end is attached to said distal end of said electrically conducting coil;

g. a suture needle attached to said distal end of said length of suture material;

h. means coupled to said length of suture material for holding said electrode in contact with said skeletal muscle; and,

i. means releasably embedded within said length of suture material for lowering a stimulation threshold of said skeletal muscle.

5,009,230

PERSONAL GLUCOSE MONITOR

Donald P. Hutchinson, Knox County, Tenn., assignor to EOL, Inc., Oak Ridge, Tenn.

Continuation-in-part of Ser. No. 345,662, May 1, 1989, Pat. No. 4,901,728, which is a continuation-in-part of Ser. No. 200,130, May 31, 1988, abandoned. This application Feb. 12, 1990, Ser. No. 475,844

Int. Cl.[5] A61B *5/00*

U.S. Cl. 128—633 **14 Claims**

1. A device for the non-invasive determination of the concentration of blood glucose in a patient which comprises:

a first source of infrared light of a selected wavelength;

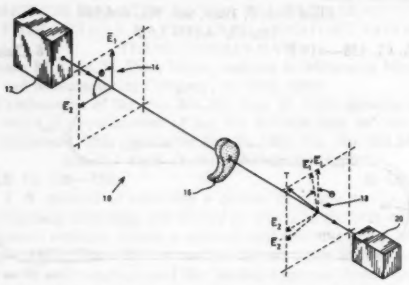
means for repetitively producing two alternating linearly-polarized orthogonal states of said infrared light, said two states being equal in amplitude;

means for directing said two states of said infrared light non-invasively through a selected tissue of said patient;

polarizing means for receiving said two states subsequent to

passage through said selected tissue of said patient, and for passage of portions of said two states in a direction of transmission of said polarizing means;

detector means for detecting the intensities of said portions of said two states passing through said polarizing means, said intensities being related to glucose concentration and absorption in said selected tissue;



means for producing a sum and a difference of said intensities of said states received by said detector means; and

means for providing a ratio of said sum and said difference of said intensities to provide a signal related only to said glucose concentration.

5,009,231

MICROPROCESSOR CONTROLLED APPARATUS FOR THE NONINVASIVE DETERMINATION OF PERIPHERAL OUTFLOW AND FLOW DISTURBANCES

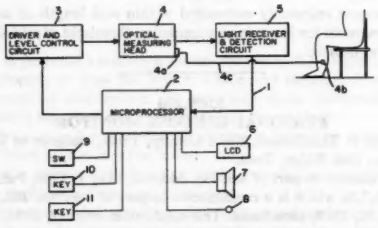
Hans J. Schmitt, and Vladimir Blazek, both of Aachen, Fed. Rep. of Germany, assignors to Fa. Nattermann Arzneimittel GmbH, Cologne, Fed. Rep. of Germany

Filed Mar. 17, 1987, Ser. No. 26,607

Claims priority, application Fed. Rep. of Germany, Mar. 18, 1986, 3609075

Int. Cl.[5] A61B *5/00*

U.S. Cl. 128—633 **12 Claims**



1. A measurement apparatus for the noninvasive determination of peripheral blood outflow and flow disturbances in veins of human beings, said apparatus including at least one light transmitter and one light receiver for directing and receiving reflected light from an extremity of said being, an evaluation and read-out circuit to ascertain blood outflow and inflow in the veins by means of measuring the change in light reflection, said evaluation and read-out circuit including means to raise, prior to said measuring, the current flowing through the light transmitter until the signal-to-noise ratio of the receiver has attained a specific value.

5,009,232

EXTRACORPOREAL LITHOTRIPSY APPARATUS USING HIGH INTENSITY SHOCK WAVES FOR CALCULUS DISINTEGRATION AND LOW INTENSITY SHOCK WAVES FOR IMAGING

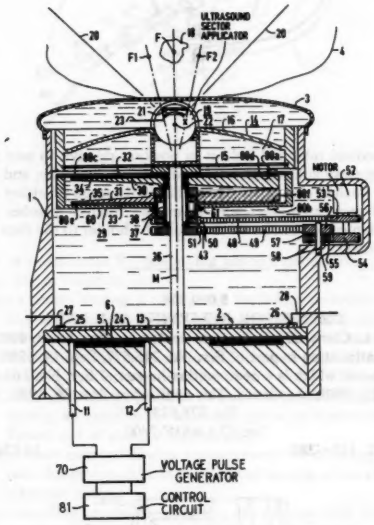
Dietrich Hassler, Uttenreuth, and Erhard Schmidt, Erlangen, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Aug. 11, 1989, Ser. No. 392,356

Claims priority, application European Pat. Off., Aug. 17, 1988, 88113375.5

Int. Cl.[5] A61B *17/22*

U.S. Cl. 128—660.03 **19 Claims**



1. An extracorporeal lithotripsy apparatus for treatment of a calculus in the body of a patient, comprising:

means for generating shock waves propagating in a propagation direction and converging in a focus zone;

means including a shock wave propagation medium for coupling shock waves generated by said means for generating shock waves into the body of said patient;

means for selectively driving said means for generating shock waves to generate high intensity shock waves converging in a focus zone of high intensity shock waves for disintegrating said calculus or for generating low-intensity shock waves for producing an image of said focus zone of high-intensity shock waves;

pressure sensor means disposed in said propagation medium for measuring echoes in the form of pressure fronts having a cross-section caused by reflection of said shock waves for generating electrical signals corresponding thereto, said pressure sensor means having a surface active for sensing pressure which is co-extensive with the cross-section of said echoes in the region of said surface;

acoustic means through which said flow intensity shock waves pass for deflecting said low-intensity shock waves, when generated, for conducting a sector scan which includes said focus zone of high-intensity shock waves; and

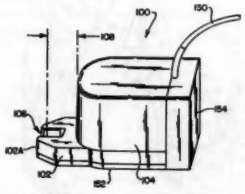
reception means connected to said pressure sensor means for generating said image of said focus zone of high-intensity shock waves from said electrical signals in the form of a B-image.

5,009,233

MINIATURIZED HAND-HELD LASER SCANNING MICROMETER

Harry G. Petrohilos, Yellow Springs, Ohio, assignor to Laser-Mike, Inc., Dayton, Ohio

Filed Jan. 10, 1989, Ser. No. 295,272
Int. Cl.[5] A61B 5/00
U.S. Cl. 128—666 **8 Claims**



1. A miniaturized laser scanning micrometer for making precision hand-held measurements comprising:

compact housing means for enclosing said miniaturized laser scanning micrometer, said housing means comprising handle means for gripping said miniaturized laser scanning micrometer and scanning gap extension means projecting from said handle means for defining a scanning gap of said miniaturized laser scanning micrometer at a distance spaced from said handle means, said scanning gap extension means being substantially thinner than said handle means and tapering in width towards its distal end to facilitate insertion of said scanning gap extension means into limited spaces to permit taking measurements therewithin;

laser beam generating means housed within said handle means for generating a collimated laser beam;

photocell means housed within said handle means for detecting said collimated laser beam;

laser beam scanning means housed within said handle means for receiving said collimated laser beam from said laser beam generating means and repeatedly scanning said collimated laser beam through a defined optical space; and

optical means housed within said handle means and said scanning gap extension means for receiving said collimated laser beam from said laser beam scanning means and directing said collimated laser beam across said scanning gap through said scanning gap extension means to said photocell means.

5,009,234

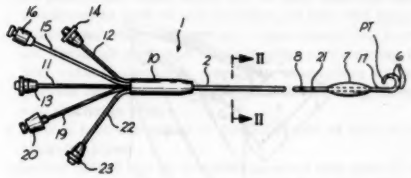
FOR THE THERMODILUTION METHOD OF DETERMINING CARDIAC OUTPUT

Eckhard Alt, Eichendorffstrasse 52, 8012 Ottobrunn, Fed. Rep. of Germany

PCT No. PCT/DE88/00240, § 371 Date Dec. 22, 1988, § 102(e) Date Dec. 22, 1988, PCT Pub. No. WO88/08274, PCT Pub. Date Nov. 3, 1988
PCT Filed Apr. 27, 1988, Ser. No. 301,760
Claims priority, application Fed. Rep. of Germany, Apr. 27, 1987, 3714027
Int. Cl.[5] A61B 5/02
U.S. Cl. 128—672 **22 Claims**

1. Instrumentation for determining cardiac output by means of a single catheter introduced along an aorta to extend into the left heart by measurement of the change of temperature resulting from the injection, comprising in combination: distal cryogen discharge means positioned on the catheter for entering a cryogen impulse into the bloodstream of the left ventricle,

a temperature sensor disposed within the catheter toward a proximal position from the cryogen discharge position for positioning in the aorta having accompanying temperature processing means for sensing temperature changes at the temperature sensor position over a cooling-warming cycle generated by said cryogen impulse to establish temperature changes effected in the bloodstream of the aorta introduced by both flow of cryogen through the catheter



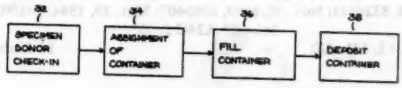
past the sensor before entering the bloodstream and flow of chilled blood toward the aorta past the single sensor in response to the injection of the cryogen impulse.

5,009,235

URINE SPECIMEN COLLECTING METHOD USING A VEHICLE

Ronald L. Messenheimer, 11909 Trailridge Dr., Potomac, Md. 20854

Filed Aug. 16, 1989, Ser. No. 394,719
Int. Cl.[5] A61B 5/00
U.S. Cl. 128—760 **3 Claims**



1. A method of collecting, without observation and in a container, urine specimens that are to be analyzed for illegal drugs comprising:

providing a highway vehicle having at least two privacy rooms each having a receptacle for disposal of urine and free of access to substances that can be used for the purpose of altering laboratory test results from the results justified by the unadulterated urine specimen of the donor, a secure area for temporary storage for filled urine containers and a reception station for a collection site person;

transporting said vehicle to a predetermined location;

directing a urine donor to said predetermined location and to the reception area of said vehicle wherein each donor is given an empty urine collection container;

marking the empty container with a unique identification indicator;

carrying the empty container into a privacy room;

filling the container with the urine sample by the donor while the donor is in one of said privacy rooms and unobserved;

returning the urine filled container to the collection site person where the container is sealed in the presence of the donor and thereafter deposited in said secure area for temporary storage; and

removing the urine containers from said temporary storage to a testing location under the controlled custody.

5,009,236

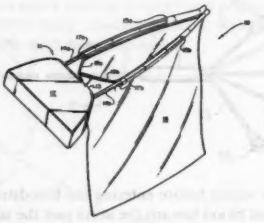
URINE COLLECTION SYSTEM

William S. Brothers, 1815 N. 1400 East, Provo, Utah 84604

Filed Jan. 29, 1990, Ser. No. 471,609
Int. Cl.[5] A61B 5/00
U.S. Cl. 128—761 **8 Claims**

1. A urine collection system comprising, a mount that includes a hand engaging means, from a front face of which mount co-planar rod means extend outwardly that are centrally bowed apart and slope towards one another to their

forward ends; a flexible bag means that includes an open top or mouth end with sleeves formed along opposite edges of said



flexible bag means mouth end; and means for closing said flexible bag means mouth end.

5,009,237

DEVICE FOR MAKING CIGARETTES

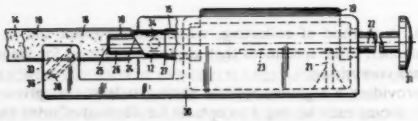
Ernst Schmidt, Stuhr; Heinz Stehmeier, Bremen; Heinrich W. Ruppert, Trossingen; Klaus G. Gatschmann, Bad Durrheim, and Gunter Schutze, Trossingen, all of Fed. Rep. of Germany, assignors to Martin Brinkmann AG, Fed. Rep. of Germany

Filed Sep. 19, 1984, Ser. No. 652,298

Claims priority, application Fed. Rep. of Germany, Sep. 20, 1983, 8326921; Nov. 30, 1983, 3343407; Mar. 19, 1984, 3410038

Int. Cl.[5] A24C *5/00*

U.S. Cl. 131—70 14 Claims



1. A device for the do-it-yourself making of a cigarette by transferring a pre-portioned tobacco rod from a cylindrical wrapping into a cigarette tube comprising:

an axially moveable pusher member having an effective end for engaging the tobacco rod;

and axially moveable insertion nozzle being insertable into said cigarette paper tube in advance of said effective end of the pusher member;

said insertion nozzle being of hollow tubular configuration and having an insertion end of smaller diameter than the cigarette papertube.

5,009,238

APPARATUS FOR SUPPLYING FIBROUS MATERIAL TO MACHINES FOR SIMULTANEOUSLY PRODUCING A PLURALITY OF CIGARETTE RODS

Uwe Heitmann, Hamburg, Fed. Rep. of Germany, assignor to Körber AG, Hamburg, Fed. Rep. of Germany

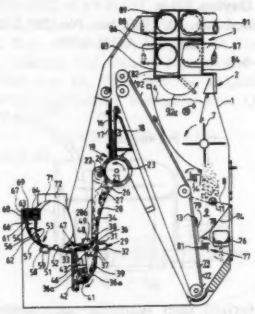
Filed Nov. 1, 1989, Ser. No. 431,473

Claims priority, application Fed. Rep. of Germany, Nov. 22, 1988, 3839354

Int. Cl.[5] A24B *7/14*

U.S. Cl. 131—108 10 Claims

1. Apparatus for supplying fibrous material, such as tobacco, to a machine for simultaneously making a plurality of rods each of which is to be subdivided into rod-shaped articles of the tobacco processing industry, comprising a distributor; a plurality of gates each having an inlet for reception of fibrous material, said gates further having outlet means for admission of fibrous material into said distributor; means for conveying fibrous material from said distributor; and means for dividing



the conveyed fibrous material into a plurality of discrete streams.

5,009,239

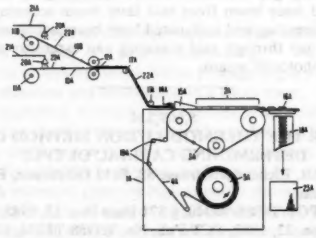
SELECTIVE DELIVERY AND RETENTION OF ALDEHYDE AND NICOTINE BY-PRODUCT FROM CIGARETTE SMOKE

Richmond R. Cohen, Hockessin, and Gary A. Luzio, Bear, both of Del., assignors to Hoechst Celanese Corporation, Bridgewater, N.J.

Filed Dec. 20, 1988, Ser. No. 286,687

Int. Cl.[5] A24D *3/06, 3/08, 3/14*

U.S. Cl. 131—342 24 Claims



1. A process for improving appearance plus selective aldehyde filter retention and selective nicotine pass through properties of a cigarette filter element comprising filter substrate in the form of at least one of synthetic thermoplastic fiber- and/or film-containing substrate material, comprising

(a) directly treating said filter substrate with an effective amount of a modifier composition comprising

(1) polyethyleneimine together with

(2) an organic acid selected from at least one of the group consisting of formic, propionic, butyric, lactic, benzoic, and acetic acid;

in an amount sufficient to obtain a buffered composition within a pH range of about pH 8 to about pH 9.5; and

(b) completing fabrication of the desired filter element;

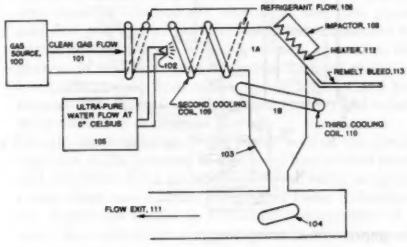
whereby selective filter retention of aldehyde smoke components and selective filter pass through of nicotine smoke components are promoted in combination.

5,009,240

WAFER CLEANING METHOD

Mark W. Levi, Utica, N.Y., assignor to United States of America, Washington, D.C.

Filed Jul. 7, 1989, Ser. No. 377,020
Int. Cl.[5] B08B 7/00; F25D 17/02
U.S. Cl. 134—7 6 Claims



1. A semiconductor wafer cleaning system which cleans a semiconductor wafer by sandblasting the semiconductor wafer with ice particles such that when said semiconductor wafer has been cleaned, any residual ice particles may be evaporated from the semiconductor's surface without leaving any contamination on said semiconductor wafer, said semiconductor wafer cleaning system comprising:

a source of pressurized gas which emits a stream of gas with a flow rate that is adjustable;

a conduit which is fixed to said source of pressurized gas so that the conduit receives and conducts said stream of gas to said semiconductor wafer;

a source of pressurized water which emits to a stream of water;

a spray head which is connected to said source of pressurized water and which protrudes into said conduit so that the spray head receives and converts said stream of water into a spray of water which is conducted by said stream of gas through said conduit; and

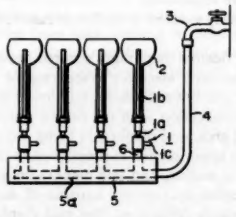
a means for cooling said spray of water to temperatures which are below a point at which water freezes, said cooling means thereby converting said spray of water into said ice particles which sandblast and clean said semiconductor wafer as they are conducted to the semiconductor wafer by said stream of gas in said conduit.

5,009,241

APPARATUS FOR WASHING NARROW NECK BOTTLES

Hideyuki Nishizawa, 1-5-1 Nakazato, Kita-ku, Tokyo, Japan

Continuation of Ser. No. 139,348, Dec. 29, 1987, abandoned.
This application May 22, 1990, Ser. No. 529,741
Claims priority, application Japan, Dec. 29, 1986, 61-312360
Int. Cl.[5] B08B 3/02, 9/08
U.S. Cl. 134—102 2 Claims



1. Apparatus for washing narrow neck bottles comprising:

a base having a header with a plurality of vertical branches;

water supply hose means connected to said header to supply water to said vertical branches of said header;

a plurality of aspirator means each having an intake end and an outlet end, there being one of said aspirator means connected to each of said branches, its inlet end being so connnected; each said aspirator mean comprising a vertical discharge pipe with an air suction port entering into said vertical discharge pipe from atmosphere so as to provide air for entrainment into water flowing through said discharge pipe;

a vertical tube connected to the outlet end of each of said aspirator pipes;

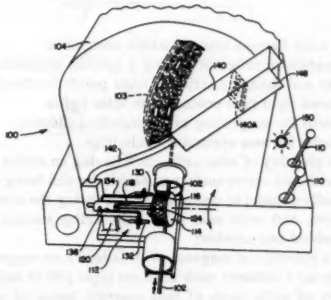
whereby bottles can be mounted inverted one each of said vertical tubes and washed by water discharged through said aspirator, which water contains a substantial quantity of air bubbles entrained from said air suction port.

5,009,242

APPARATUS FOR MONITORING SEWER CLEANING TOOL EXTENSION

Charles J. Prange, Cridersville, Ohio, assignor to Sewer Rodding Equipment Company, Lima, Ohio

Filed Sep. 12, 1989, Ser. No. 405,988
Int. Cl.[5] B08B 9/04
U.S. Cl. 134—113 6 Claims



1. A mobile sewer cleaning machine comprising:

an elongated sewer cleaning tool wound upon a reel mounted in a reel compartment of the machine;

motor means coupled to said reel for rotating said reel;

motor control means for operating said motor means in one direction to play out said tool into a sewer by unwinding it from said reel, and in the direction opposite to said one direction to retract said tool from said sewer by rewinding said tool onto said reel;

movement signaling means coupled to said tool for generating signals representative of play out of said tool in defined incremental lengths and retraction of said tool in defined incremental lengths, said movement signaling means comprising:

a rotatably mounted tool sensing drum which is frictionally engaged with and rotated by said tool and including a position indicator mounted thereto,

two proximity sensors positioned to sense said position indicator as said drum is rotated, and

switch means coupled to said motor control means for activating one of said proximity sensors upon rotation of said motor means in said one direction and the other of said proximity sensors upon rotation of said motor means in said opposite direction;

electronic counter means connected to said movement signaling means and responsive to said signals for displaying a count representative of the extent of said elongated sewer cleaning tool which has been unwound from said reel and/or rewound onto said reel, said electronic counter means including input means for selecting a de-

sired count and output means for indicating when a desired count has been reached; and

alarm means connected to the output means of said electronic counter means connected to the output means of said electronic counter means for generating an alarm signal upon reaching said desired count.

5,009,243

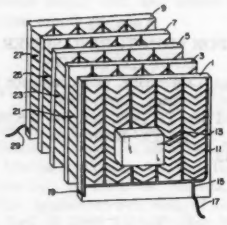
SOLAR HARNESS

Owen P. Barker, 455 W. State St. MD2, Trenton, N.J. 08618

Continuation-in-part of Ser. No. 889,167, Jul. 25, 1986, abandoned. This application May 21, 1990, Ser. No. 525,606

Int. Cl.[5] H01L *31/042, 31/048, 31/052*

U.S. Cl. 136—246 **50 Claims**



21. A solar harness system, which comprises:

(a) a parabolic reflector having a specific theoretical focal point and having a series of focal points for the different colored light rays contained in solar lights;

(b) means for supporting said parabolic reflector;

(c) a solar harness apparatus, including:

(i) a plurality of solar cells, each having an active surface, with said active surface of each solar cell being substantially parallel to one another and facing the same direction, and with said solar cells being stacked in line behind one another;

(ii) a plurality of magnets, with at least one magnet being located between each adjacent solar cell in said plurality of cells, each of said magnets being of adequate magnetic power to hold said plurality of solar cells in stacked arrangement therewith, without any other support and so as to create solderless contacts with each solar cell in series;

(iii) means connected to one end of said stacked arrangement of plurality of solar cells and magnets for drawing electric current therefrom;

(d) means for supporting said solar harness apparatus at the focal point of a color of the colored light rays in solar light other than the red color focal point.

5,009,244

FIRE FIGHTING FOAM MIXING SYSTEM

John R. Grindley, and Robert M. Grindley, both of Los Angeles, Calif., assignors to Grindley, Inc. and Robwen, Inc., both of Los Angeles, Calif.

Filed Aug. 17, 1989, Ser. No. 395,321

Int. Cl.[5] G05D *11/03*

U.S. Cl. 137—101.11 **8 Claims**

1. In a fire fighting system for proportioning the injection of foam into a fluid stream, having

a primary fluid delivery conduit having an inlet and an outlet;

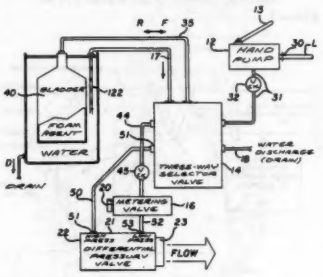
valve means in said conduit for maintaining the fluid pressure adjacent said inlet above the adjacent said outlet that;

a foaming agent reservoir;

means for conducting foaming agent from said reservoir to said fluid conduit adjacent the outlet thereof and;

means for pressurizing said reservoir to expel foaming agent therefrom through said foaming agent conducting means including;

a secondary fluid delivery conduit between said primary fluid conduit adjacent the inlet thereof and said reservoir;



the improvement comprising;

means automatically operable in response to movement of said valve means for varying the flow of fluid through said secondary fluid conduit.

5,009,245

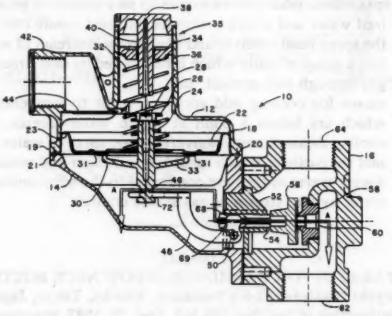
PRESSURE REGULATOR

John L. Esola, Falls Creek, and David L. Kessler, DuBois, both of Pa., assignors to M&FC Holding Company, Inc., Wilmington, Del.

Continuation of Ser. No. 354,499, May 19, 1989, abandoned. This application Sep. 20, 1990, Ser. No. 587,621

Int. Cl.[5] G05D *16/06*

U.S. Cl. 137—116.5 **11 Claims**



1. A pressure regulator for connection to a body having a gas inlet and a gas outlet, the gas inlet being in fluid communication with the gas outlet through an orifice restriction, said pressure regulator comprising:

a substantially concave lower case defining a throat area of the pressure regulator;

a cover assembly secured to the lower case to define an inner chamber;

a contoured, flexible diaphragm secured between the lower case and the cover assembly to separate the inner chamber into upper and lower sections, said lower section being in fluid communication with the orifice restriction through said throat area, said diaphragm being capable of deflecting into the upper section in proportion to the gas pressure in the lower section, and said diaphragm having an outer circumferential corrugation capable of deforming when said diaphragm deflects so that said diaphragm will not experience material deformation during deflection;

means for controlling the deflection of the diaphragm so that

the deflection is predictable in relation to the gas pressure in said lower section;

a one piece, curved lever arm in mechanical communication with said diaphragm, said lever arm comprising an upper portion slidably connected to a coupling member fixed to said diaphragm, said upper portion being movable with said coupling member, a first portion of said lever arm extending from said upper portion of said lever arm and substantially normal thereto, a second portion of said lever arm disposed substantially normal to said first portion, said first and second portions being interconnected by a partial annulus portion of said lever arm, and a stem drive portion of said lever arm extending from an end of said lever arm remote from said coupling member and being substantially normal to said second portion and substantially normal to said upper portion;

a fulcrum pin positioned in the throat area of the pressure regulator at the junction of said lever arm second portion and said stem drive portion, said lever being adapted to rotate about said fulcrum pin so that linear deflection of the diaphragm results in rotational displacement of the lever arm, said lever arm and fulcrum pin arrangement providing a lever ratio greater than 3:1; and

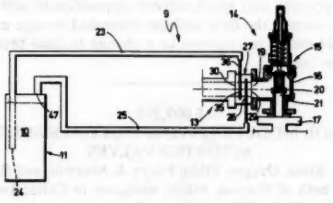
a throat assembly comprising a stem member connected to said stem drive portion of said lever arm, a stem guide disposed in a wall of said lower case in said throat area, said fulcrum pin being mounted in said stem guide, said stem member being slidably disposed in said stem guide, a distal end of said stem drive portion being disposed in said stem member and a valve pad fixed to said stem member and movable therewith, whereby said valve pad is in mechanical communication with said lever arm so that increased pressure in the lower section, causing the diaphragm to deflect away from said lower section, causes rotational displacement of the lever arm which linearly displaces the valve pad toward said orifice restriction to restrict the flow of gas from the gas inlet to the gas outlet.

5,009,246

SYSTEM TO AVOID ICING IN THE DISCHARGE PIPING OF A PRESSURE RELIEF VALVE

Gary J. Giles, Pineville, La., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Nov. 4, 1988, Ser. No. 267,416
Int. Cl.[5] B67D *5/00*
U.S. Cl. 137—205.5 **17 Claims**



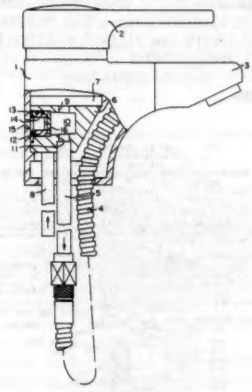
1. In combination, a safety relief valve for a pressurized system, said valve including a housing, a nozzle mounted within said housing and communicating with said pressurized system, an outlet from said housing in flow communication with said nozzle, a closure member normally urged into a shut position to prevent the discharge of pressure fluid from said nozzle to said outlet, discharge piping connected to said valve housing in fluid communication with said nozzle through said outlet thereby to define a discharge flow path to receive a high mass flow of gas discharged from said nozzle when fluid in said system becomes over pressurized and urges said closure member into an open position, a reservoir for an anti-solidifying agent, inlet and outlet lines communicating between said discharge flow path and said reservoir, a high pressure probe connected to said inlet line and extending into said discharge flow path, said high pressure probe including an inlet orifice positioned in said flow path and opening in a direction facing at least partially upstream relative to said flow path to communicate a volume of discharge gas at a first pressure greater than the static pressure of said discharge gas flow from said path to said reservoir, and an injection probe connected to said outlet line and extending into said discharge flow path, said injection probe including an outlet orifice positioned in said flow path and opening in a direction facing at least partially downstream relative to said flow path to communicate to said reservoir a second pressure no greater than the static pressure of said discharge gas flow so said anti-solidifying agent may be driven from said reservoir into said discharge gas flow by a driving pressure representative of the difference in said first and second pressures.

5,009,247

PIPE INTERRUPTER

Hans Oberdörfer, Stuttgart, Fed. Rep. of Germany, assignor to Hansa Metallwerke AG, Stuttgart, Fed. Rep. of Germany

Filed Oct. 24, 1989, Ser. No. 425,944
Claims priority, application Fed. Rep. of Germany, Oct. 31, 1988, 3837032
Int. Cl.[5] F16K *24/02*
U.S. Cl. 137—218 **3 Claims**



1. Sanitary fitting comprising

(a) a fitting body (1) having a base part (6);

(b) an outlet mouthpiece (3) which can be pulled out and which is connected by way of a flexible hose (4) to an outlet pipe (5) fastened in said base part (6), said flexible hose being arranged in a loop which is guided partly inside said fitting body (1);

(c) control elements (7) inside said fitting body (1) for controlling the water flow through said fitting;

(d) a chamber (10) provided in said base part (6) and opening into said chamber an inlet pipe (9) for water coming from said control elements (7), said outlet pipe (5) and a ventilating passage (14);

(e) a hollow, cylindrical insert (13) inserted into said chamber (1) from the side and sealed against the wall of said chamber (10);

(f) a closing flap (16) mounted in said chamber (1) which, in the event of a reduced pressure in the inlet pipe (9), both closes the inlet pipe (9) and opens the ventilation passage (14), said closing flap (16) being formed from a single piece of resilient elastic material that includes

(1) an attachment section (18) that is secured by said insert (13) in a fixed position at the wall of said chamber (10);

(2) a single planar closing section (19) joined to and extending outwardly in a single plane from said attach-

ment section (18), which closing section is movable in the manner of a hinge through an angle extending between

a first position in which it bears against and by itself covers and closes off said ventilation passage (14) solely by virtue of its elastic resilient when there is no reduced pressure in said inlet pipe (9), and

a second position in which said elastic resiliency of the single planar closing section (19) that biases it against said ventilation passage (14) is overcome by reduced pressure in the inlet pipe (9) and the single planar closing section (19) moves through a single arc to a position where it by itself covers and closes off said inlet pipe (9).

5,009,248

FLOWMETER

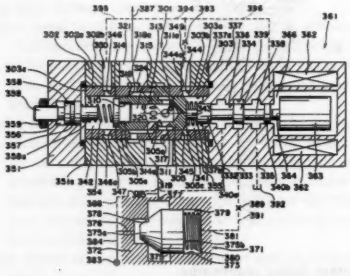
Kenji Masuda, Settsu, Japan, assignor to Daikin Industries, Ltd., Osaka, Japan

Division of Ser. No. 251,219, Aug. 8, 1988, Pat. No. 4,969,364. This application Jul. 27, 1990, Ser. No. 558,622

Claims priority, application Japan, Dec. 8, 1986, 61-291960; Dec. 23, 1986, 61-310415; Jan. 21, 1987, 62-12781; Feb. 6, 1987, 62-26539; Feb. 7, 1987, 62-26728

Int. Cl.[5] G05D *7/00*

U.S. Cl. 137—486 **6 Claims**



1. A flow control valve comprising a flow detective unit, a flow-regulating unit, and means for setting the flow rate,

said flow detective unit comprising a main body structure having an interior, generally cylindrical chamber, a detective core having a longitudinal axis and being slidably fitted in said chamber, a spool which is connected to said detective core and which controls passageways between a plurality of ports in the manner of shifting, inflow passageways formed in said main body structure for leading a flowing fluid into said detective core, and outflow passageways formed in said detective core for leading the fluid drawn in by said inflow passageways into said main body structure, at least either said inflow passageways or said outflow passageways being inclined with respect to the axis of the detective core;

said flow-regulating unit comprising a valve element for opening and shutting the supply passageway leading to said inflow passageway and a chamber opened to one end of said valve element and connected to one of said plurality of ports which is used for pressure control; and

said means for setting the flow rate applies a prescribed force to said detective core and actuates said spool by balancing force produced by changes in momentum of a flowing fluid and acting on said detective core.

5,009,249

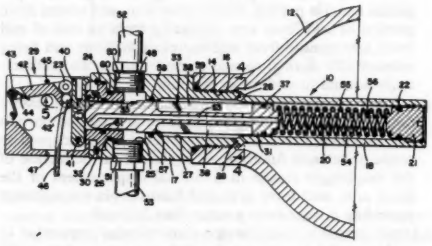
VALVE FOR FLUID CONTAINER

John M. Fisher, Cuyahoga Falls, Ohio, and David R. Young, Snohomish, Wash., assignors to The B. F. Goodrich Company, Akron, Ohio

Filed Apr. 16, 1990, Ser. No. 509,692

Int. Cl.[5] F16K *31/143*

U.S. Cl. 137—495 **9 Claims**



1. A pressure regulator for regulating the transfer of pressurized fluids at a controlled rate to an inflatable member comprising: a fluid pressurized storage means, a housing means mounted on said storage means, said housing means having a first chamber with an outlet means for connection to said inflatable member, said first chamber defining a low pressure chamber, a central bore in said housing means interconnecting said first chamber with said storage means, a regulator spool valve mounted in said central bore, said central bore cooperative with said spool valve to define a high pressure chamber, said spool valve in an inoperative condition to seal the flow of fluids from said storage means to said outlet means, said spool valve in an operative condition to communicate said storage means with said outlet means via said high pressure chamber, a trigger release means operatively connected to said spool valve, said trigger release means operative upon actuation to place said spool valve from said inoperative condition to said operative condition, a first spring in said bore operative solely upon actuation of said trigger means to assist said first spring and to bias said spool valve to interconnect said outlet means to said fluid storage means, and said spool valve having annular shoulder disposed in said low pressure chamber that is operative when said spool valve is in said operative condition to variably position said spool valve in opposition to said second spring to throttle the flow of fluids from said storage means to said outlet means in response to a change in fluid pressure at said outlet means.

5,009,250

CONTROL MODULE HAVING MULTIPLE SOLENOID ACTUATED VALVES

Loren H. Kline, Oregon, Ohio; Harry A. Sherwin, and Robert J. Telep, both of Warren, Mich., assignors to Coltec Industries Inc., New York, N.Y.

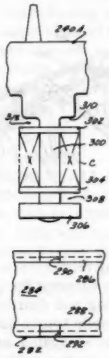
Continuation-in-part of Ser. No. 324,766, Mar. 17, 1989, Pat. No. 4,913,189. This application Apr. 2, 1990, Ser. No. 503,396

Int. Cl.[5] F16K *31/02*

U.S. Cl. 137—596.17 **5 Claims**

1. A multiple solenoid valve assembly comprising a manifold and a plurality of like generally cylindrical solenoid valve assemblies mounted upon said manifold to project rearwardly from said manifold with the axes of said valve assemblies in spaced parallel relationship to each other, each of said valve assemblies comprising a hollow tubular stem connected at its forward end to said manifold and slidably receiving a magnetically shiftable valve member within its forward end portion and fixedly sealingly receiving a pole piece within its rearward end portion, a first radially projecting flange integral with said stem at a location adjacent the forward end of said stem, a second radially projecting flange integral with said stem at a

location adjacent the rearward end of said stem, a solenoid coil mounted on said stem between said first and second flanges, a connector block mounted on said stem at the rearward end of said stem in rearwardly spaced relationship to said second flange, and a metal mounting bracket including a base portion and front and rear webs projecting upwardly from said base portion in spaced parallel relationship to each other, each of said front and rear webs having a plurality of upwardly opening stem receiving U-shaped recesses extending downwardly



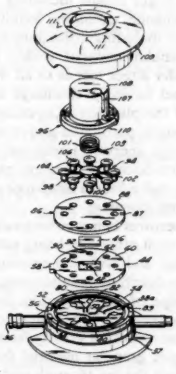
from the upper edge of the web of a width equal to the outer diameter of said stem, the recesses in said front and rear webs being aligned with each other and said front and rear webs being spaced from each other to accommodate the insertion of a stem of a valve assembly into aligned recesses in said front and rear webs with the rearward side of said front web in face to face engagement with the forward side of the first flange on the stem and the forward side of said rear web in face to face engagement with the rearward side of the second flange on said web.

5,009,251

FLUID FLOW CONTROL

Kelly A. Pike, Laguna Hills, and Stephen R. Hessel, Fountain Valley, both of Calif., assignors to Baxter International, Inc., Deerfield, Ill.

Filed Nov. 15, 1988, Ser. No. 271,730
Int. Cl.[5] F16K *11/16*
U.S. Cl. 137—601 **17 Claims**



1. A flow controller for regulating the rate of flow from a source of fluid under pressure, comprising:

(a) a housing having an influent, effluent port, and fluid flow path therebetween;

(b) a flow restriction channel in the flow path, for regulating the rate of flow, said restriction channel having an influent end and at least two effluent apertures along its length;

(c) a valve in the housing associated with each of the apertures along the flow path; and

(d) a single control for selectively opening any one of the valves and maintaining each additional valve closed;

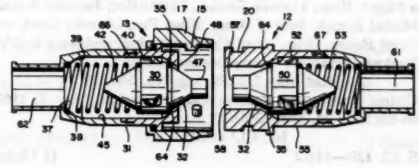
wherein the opening of any one of the valves places in the influent port in fluid communication with effluent port by way of the a unique length of flow restriction channels associated with the open valve.

5,009,252

AIR DISTRIBUTION CONNECTOR VALVE

Jim A. Faughn, Bel Air, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 3, 1990, Ser. No. 519,518
Int. Cl.[5] F16L *29/00*
U.S. Cl. 137—614.04 **1 Claim**



1. An air distribution connector valve comprising:

first and second mating connectors;

each connector including a self-closing, one way valve arranged and adapted to interfere with the valve of the other connector when the two connectors are mated together, whereby to open the two valves for unrestricted passage of air therethrough;

each connector includes engagement means for separably coupling the two connectors together to produce the interference between said valves;

each valve includes a valve body, and a compression spring associated and aligned therewith;

each connector further includes a valve housing having an axis of symmetry; the valve body of each connector being retained and slidable axially within the valve housing against the force exerted by the associated compression spring, and the valve body being normally urged by the associated compression spring against an end wall of the housing having a circular opening therein, so that the valve body is normally seated against the end wall to block said opening;

said valve body is cylindrical and includes spacing means on its cylindrical surface for separating the valve body from the inner surface of the associated valve housing,

said spacing means have holes therein to allow passage of air therethrough from the opening in said end wall to the other end of the associated valve housing when the valve body is unseated from said end wall;

each said valve body includes an end portion axially projecting through said opening when the valve body is normally seated against the end wall of the associated valve housing, said end portion having an end surface arranged and adapted to confront and abut against the end surface of the valve body of the other connector and to interfere with one another as the two connectors are being coupled together, so that both valve bodies are unseated from the end wall of their associated valve housings when the two connectors are fully coupled together and are reseated when the two connectors are fully uncoupled, whereby an air distribution passageway is formed through the entirety

of the coupled connectors and is automatically closed at each half of the uncoupled connectors;

said engagement means of one of said connectors includes a captive, rotatable ring having a plurality of spaced teeth on the inner surface of said ring;

said engagement means of the other connector includes a plurality of helical grooves equal in number to the number of said teeth, and arranged and adapted to receive and accept the teeth, and, when accepted and the ring is rotated, the teeth ride within the helical grooves to fully couple or uncouple the connectors depending on the direction of rotation of the ring;

said engagement means of the other connector further includes pin means for locking the teeth in position at the end of each of the associated helical grooves, said teeth and said pin means being releasable by exertion of pressure on the ring in the direction opposite that in which the teeth were fully engaged in the helical grooves.

5,009,253

DEVICE FOR REMOVING A THREAD, WITH ROTATABLE RING AND ROTATABLE BOOM FOR CLAMPING AN END OF THE THREAD

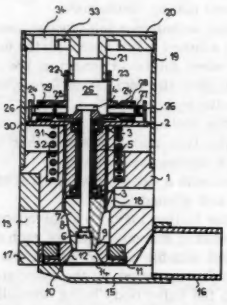
Jan Pajgrt, Brno; Vincenc Smetak, Lelekovice; Jaroslav Kalina; Michal Zemek, both of Brno; Milan Pus, Uhersky Brod, and Pavel Bucek, Brno, all of Czechoslovakia, assignors to ZVS Vyzkumnevyvojovy ustav, Czechoslovakia

Filed May 2, 1989, Ser. No. 346,398

Claims priority, application Czechoslovakia, May 3, 1988, 2966-88; May 24, 1988, 3510-88

Int. Cl.[5] D03D *47/30*

U.S. Cl. 139—116.2 **11 Claims**



1. A device for removing a thread, said device comprising:

(A) a rotatable ring with an inner conical surface;

(B) a rotatable boom with an outer conical surface, said rotatable boom being axially displaceable toward said rotatable ring to clamp an end of the thread between said inner conical surface of said rotatable ring and said outer conical surface of said rotatable boom; and

(C) driving means for (1) displacing said rotatable boom toward said rotatable ring to clamp the end of the thread between said inner conical surface of said rotatable ring and said outer conical surface of said rotatable boom and (2) rotating said rotatable boom while the end of the thread is clamped between said inner conical surface of said rotatable ring and said outer conical surface of said rotatable boom;

wherein said driving means is directly operatively connected to said rotatable boom;

wherein said ring, said boom and said driving means are coaxial with each other;

wherein said driving means includes (1) displacing means for axially displacing said boom and (2) a pneumatically reactive driving unit operable for rotating said boom, said displacing means and said reactive driving unit having means permitting them to be driven by a common source of pressurized air.

5,009,254

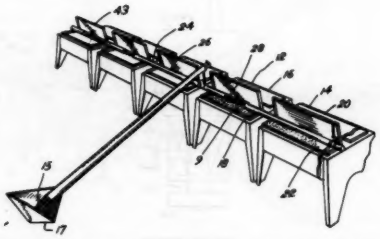
APPARATUS TO FILL SEED/FERTILIZER DRILLS

Gerald Brunner, Box 15, Conrad, Mont. 59425

Filed Nov. 20, 1989, Ser. No. 439,635

Int. Cl.[5] B65G *67/06*

U.S. Cl. 141—35 **2 Claims**



1. A seed drill including retractable towing wheels, disks and means for attachment to a tractor for pulling of the seed drill by a tractor, for receiving and distributing granular material such as seeds from a mobile source such as a truck, the seed drill being longitudinally elongated and being longitudinally symmetrical about a centerline, and further comprising, in combination:

(a) a plurality of bins for holding said granular material, including at least a first bin, a second bin, a third bin and a fourth bin, the bins being spaced longitudinally, the first and second bins being alongside the centerline and the third and fourth bins being across the centerline from the first and second bins;

each of the plurality of bins having an upper edge defining opening, the first bin having an upper edge defining a first opening, the second bin having an upper edge defining a second opening, the third bin having an upper edge defining a third opening, and the fourth bin having an upper edge defining a fourth opening;

the upper edges and openings of the plurality of bins, including the upper edges and the first, second, third and fourth openings of the first through fourth bins, being in longitudinally spaced relationship with each other and being substantially coplanar;

(b) transfer auger means and distribution auger means for distributing the granular material from the source to the plurality of bins;

the distribution auger means including a substantially enclosed auger channel extending longitudinally across the bins and further including a distribution auger for drivably conveying granular material within the auger channel from the transfer auger means to all the bins;

the auger channel having a discharge aperture positioned above each of the plurality of openings, including a first discharge aperture positioned above said first opening, a second discharge aperture positioned above said second opening, a third discharge aperture positioned above the third opening, and a fourth discharge aperture positioned above the fourth opening;

the discharge apertures being in longitudinally spaced relationship with each other and being substantially coplanar with each other and with the openings, in an operative position of the distribution auger means;

(c) the upper edge of said each bin, its opening, and the respecti discharge aperture being constructed and arranged to define means for gravity feeding substantially all of said conveyed granular material from the distribution auger means into the bin through said discharge aperture and said opening until said granular material reaches the height of said discharge aperture for substantially stop-

ping all the flow of said granular material through said discharge aperture to said bin while said bin stores substantially all of said conveyed granular material gravity fed therein;

the upper edge of each bin, its opening and the respective discharge aperture being further constructed and arranged to define means for gravity feeding substantially all of said conveyed granular material from said distribution auger means into said bin through said discharge aperture and said opening, after the flow of said granular material to others of said bins has been stopped;

(d) the transfer auger means having a transverse extent and including a transfer auger channel extending transversely to the discharge auger channel and further including a transfer auger for drivably conveying granular material within the transfer auger channel from the source to the distribution auger means.

5,009,255

VERSATILE STRUCTURE FOR ALL MACHINING WORK MAINLY ON SOFT MATERIALS

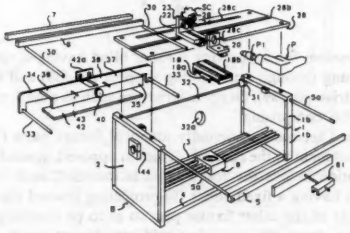
Paul Fournel, 12 Allee des Chênes, 42580 L'Etrat, France

Filed Jul. 24, 1989, Ser. No. 383,451

Claims priority, application France, Jul. 25, 1988, 88 10342; Jul. 11, 1989, 89 09661

Int. Cl.[5] B27C *9/00*

U.S. Cl. 144—1 R **7 Claims**



1. A multi-purpose motorized tool holding structure for machining operations comprising a generally parallelepipedic stand means (B), said stand including two separated parallel frame means (1, 2), said frame means having bottom portions, two fixed transverses (3, 4), said frame means being connected at said bottom portion by said two fixed traverses, said frame means having parallel guide slide means (8) affixed therebetween substantially centrally of said frame means, a saddle means (9–19) slidably mounted on said guide means, a changeable tool carrier (23–47) and a rotary tool driving motor mounted on said saddle means (P) said tool driving motor operatively connected to rotatably drive said changeable tool carrier, whereby said changeable tool carrier may be used for different machining operations on various materials.

5,009,256

CORD-TYPE TIRE TRACTION DEVICE

Franklin G. Smith, Portland, Oreg., assignor to Manufacturer's Consultants, Inc., Portland, Oreg.

Filed Dec. 21, 1988, Ser. No. 288,619

Int. Cl.[5] B60C *27/06*; B65H *69/04*; A44B *1/04, 11/25*

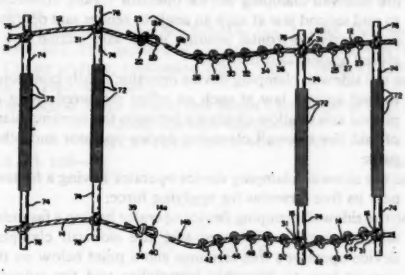
U.S. Cl. 152—221 **35 Claims**

1. A tire traction device for vehicle tires having treads, comprising:

a pair of longitudinal side cord members for extending circumferentially of a tire along opposite sidewalls thereof, opposite ends of each said side cord member being interconnectable; and

multiple cross cord members spaced along the length of said side cord members and extending between and joining said pair of side cord members for extending across said tire treads, said cross cord members being joined to said side cord members at knotted connections;

each knotted connection including at least one knot on the



connected side cord member and adjacent means on the connected cross cord member cooperable with the knot to at least limit relative lateral displacement of the connected side and cross cord members at the knotted connection.

5,009,257

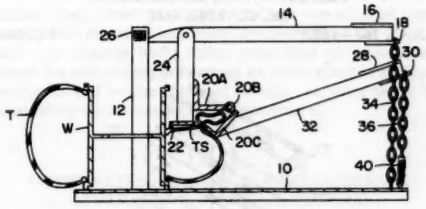
TIRE BREAKER APPARATUS FOR ALL-TERRAIN VEHICLE TIRES

Richard R. Reeves, HC 66 Box 36A, Kinder, La. 70648

Filed May 15, 1990, Ser. No. 525,401

Int. Cl.[5] B60C *25/02*

U.S. Cl. 157—1.26 **1 Claim**



1. A bead breaker for displacing the bead of a deflated ATV tire from the flange of a wheel upon which said tire is mounted by uniquely clamping the tire sidewall in a fixed position relative to the bead pressing member, so as to insure breaking of the bead during downward movement of the bead pressing member with said bead breaker comprising;

a stand having a wheel and tire receiving horizontal support base and a linkage supporting upright post extending upwardly and perpendicularly therefrom;

the upright post having multiple pin holes on upper extermity to provide alternative fulcrum pin locations, both horizontally and vertically;

a bead pressing operator detachably connected at one of its ends to the said upright post by a hook shaped connector;

the bead pressing operator pivotally connected at said one of its ends to the upper extremity of said upright post by fulcrum pin;

the bead pressing operator having a footrest near its opposite free terminus for applying force;

the bead pressing operator having a fastening means interactive between said bead pressing operator's free terminus and a point below on the support base to releasibly immobilize said bead pressing operator in a deployed position;

a bead press support column pivotally connected at its upper terminus to said bead pressing operator and with a bead press shoe fixed to its lower terminus;

a first jaw fixed perpendicular to said press support comumn

and disposed in a position to lie immediately above tire sidewall;

a second jaw pivotally connected to said first jaw so as to allow said second jaw to close against said first jaw;

a tire sidewall clamping device operator rigidly connected to said second jaw at such an angle to render said operator in a nearly horizontal position when said second jaw is closed against said first jaw;

the tire sidewall clamping device operator rigidly connected to said second jaw at such an offset measured along its pivotal axis to allow clearance between the working plane of said tire sidewall clamping device operator and other parts;

the tire sidewall clamping device operator having a footrest near its free terminus for applying force;

the tire sidewall clamping device operator having a fastening means interactive between said tire sidewall clamping device operator's free terminus and a point below on the support base to releasibly immobilize said tire sidewall clamping device operator in a fixed position relative to the bead press shoe;

said tire sidewall clamping device operator fastening means to include a chain with spring to allow for movement of said tire sidewall clamping device operator with respect to support base.

5,009,258

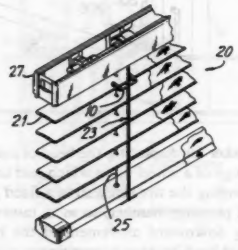
METHOD AND CLIP FOR SECURING A SLAT OF A VENETIAN BLIND

Donald E. Fraser, Ramsey, N.J., assignor to Hunter Douglas Inc., Upper Saddle River, N.J.

Filed Dec. 8, 1988, Ser. No. 281,561

Int. Cl.[5] E06B 9/36

U.S. Cl. 160—168.1 **4 Claims**



1. A Venetian blind and clip for securing a slat of said blind, comprising in combination:

a ladder cord having vertically extending side legs connected by cross rungs;

at least one slat supported by said cross rungs of said ladder cord;

a raising/lowering cord extending vertically and running through an aperture defined in said slat; and

a press-on clip securable on a single edge of the slat for securing the slat to its supporting rung, said clip comprising

a first generally planar prong, and second and third prongs formed integrally with and opposed to said first prong, said second and third prongs being spaced from said first prong in order to receive a slat therebetween, said second and third prongs being spaced from one another on either side of said first prong,

whereby when said fastener is urged over a slat resting on a cross rung of a ladder of a Venetian blind said second and third prongs cause said first prong to urge the cross rung into frictional engagement with the under side of the slat.

5,009,259

ROLLER BLIND SUPPORT

Ludwig Miloslaus, Trittau, Fed. Rep. of Germany, assignor to Aerolux Produktions- und Handelsgesellschaft mbH, Norderstedt, Fed. Rep. of Germany

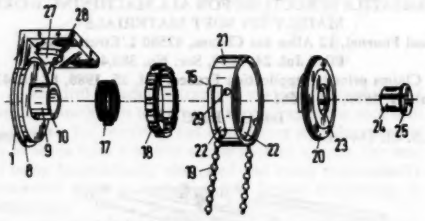
PCT No. PCT/EP88/00139, § 371 Date Aug. 24, 1989, § 102(e) Date Aug. 24, 1989, PCT Pub. No. WO88/06672, PCT Pub. Date Sep. 7, 1988

PCT Filed Feb. 25, 1988, Ser. No. 399,494

Claims priority, application Fed. Rep. of Germany, Feb. 28, 1987, 8703112[U]

Int. Cl.[5] E06B 9/17

U.S. Cl. 160—323.1 **12 Claims**



1. A system for supporting a roller blind having a rotation axis passing through a projecting support pin (38) and a projecting drive pin (39), on room structure such as a wall, ceiling or the like, comprising:

first and second substantially identical fixture parts (1) for attachment to the room structure in opposed, spaced apart relation before the roller blind is installed, each fixture part having a fixed collar (9) projecting toward the fixed collar of the other fixture part so as to be coaxially centered about the axis after said attachment, each collar having a passage aperture (10) extending radially therethrough;

a first bearing part (2) rotatably disposed on the first fixture part and including means for selectively securing the bearing part in a particular rotational position so as to prevent accidental rotation, the bearing part further including a fixed bearing shell (13) in coaxial, overlapped relation to the collar for rotatably receiving the support pin (38), the bearing part further having an insertion aperture (14) which extends radially through the shell, whereby

when the bearing part is in a rotationally open position relative to the collar such that the insertion aperture (14) is aligned with the passage aperture (10) in the collar, the support pin (38) can be displaced radially along the insertion aperture between an initial position outside the bearing part to a final position on the axis in the shell; and

when the bearing part (2) is selectively rotated to said particular position, the passage aperture is closed and the pin (38) is trapped on the axis within the shell (13) and collar; and

a second bearing part disposed on the second fixture part and including

drive pin support means (24,25) for non-rotatably engaging the drive pin (39), and

drive means (17–23) including a drag spring (17) for selectively rotating the drive pin support means, said drag spring being positioned coaxially around the collar (9) of the second fixture part.

5,009,260

VACUUM LIFT FOAM FILLED CASTING SYSTEM

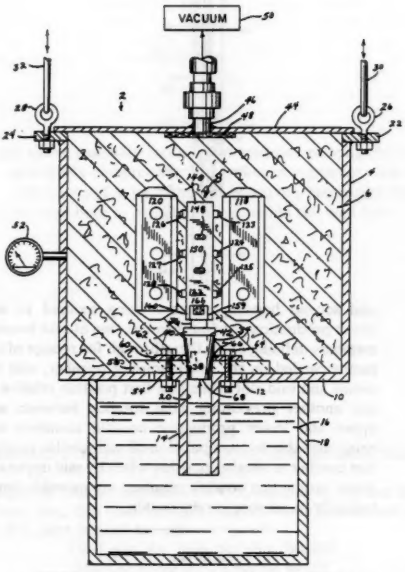
Terrance M. Cleary, Allenton; Raymond J. Donahue, Fond due Lac; William G. Hesterberg, Rosendale, and Lawrence I. Toriello, Fond du Lac, all of Wis., assignors to Brunswick Corporation, Skokie, Ill.

Continuation-in-part of Ser. No. 160,729, Feb. 26, 1988, Pat. No. 4,830,085, which is a continuation of Ser. No. 946,812, Dec. 29, 1986, Pat. No. 4,787,434. This application Jul. 20, 1989, Ser. No. 351,599

The portion of the term of this patent subsequent to Nov. 29, 2005, has been disclaimed.

Int. Cl.[5] B22D *18/06*

U.S. Cl. 164—255 6 Claims



1. A lost foam casting apparatus comprising, a flask for holding unbonded particulate material, a source of molten metal external of said flask, a pattern assembly composed of an evaporable foam material disposed in said flask and surrounded by said particulate material, fill means having a fill passage providing communication between said flask and said source of molten metal, means for applying a vacuum to said flask and to said particulate material, and an annular gas permeable member disposed in said flask and having a central opening providing communication between said pattern assembly material and said fill passage, at least a portion of the periphery of said member being exposed to said particulate material, said member being composed of randomly oriented ceramic fibers permeable to the flow of gas and impermeable to the flow of molten metal, application of a vacuum to said flask drawing gas from said fill passage through said member and into said particulate material, said vacuum being of sufficient magnitude to cause molten metal to be drawn through said fill passage from said source of molten metal and through the opening in said member and into contact with said foam material to vaporize said foam material with the vapor being entrapped within the interstices in said particular material and said molten metal filling the void created by vaporization of said foam material.

5,009,261

DEVICE FOR PROVIDING COMMUNICATION BETWEEN WATER TANKS OF HEAT ACCUMULATION TANK SYSTEM

Takashi Kuhara, 20-16, Kamiyama-cho, Shibuya-ku, Tokyo 150, Japan

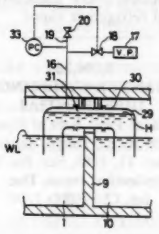
Continuation of Ser. No. 208,416, Jun. 1, 1988, Pat. No. 4,887,667. This application Oct. 26, 1989, Ser. No. 426,718

Claims priority, application Japan, Oct. 1, 1986, 61-233735; Sep. 1, 1987, 62-218865

The portion of the term of this patent subsequent to Dec. 19, 2006, has been disclaimed.

Int. Cl.[5] F24D *11/00*; F04F *10/00*

U.S. Cl. 165—96 3 Claims



1. In a heat accumulation tank system having a plurality of water tanks separated by partition walls, a communication control device for controlling the state of communication between two adjacent water tanks in said system, comprising: an inverse U-shaped passage disposed between said two adjacent water tanks such that one end of said inverse U-shaped passage opens downwardly in one of said two adjacent water tanks while the other end opens downwardly in the other of said two adjacent water tanks; pressurized air introduction means for introducing pressurized air to the space in an upper portion of said inverse U-shaped passage; and valve means for controlling the introduction of pressurized air.

5,009,262

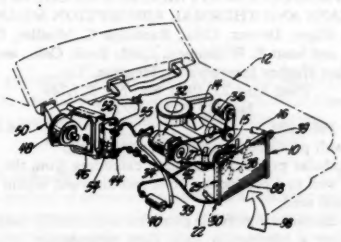
COMBINATION RADIATOR AND CONDENSER APPARATUS FOR MOTOR VEHICLE

Gary A. Halstead, Lockport, and Ronald C. Treloar, Williamsville, both of N.Y., assignors to General Motors Corporation, Detroit, Mich.

Filed Jun. 19, 1990, Ser. No. 540,015

Int. Cl.[5] F28D *7/16*

U.S. Cl. 165—140 39 Claims



1. A combination radiator and condenser apparatus for a motor vehicle having a plurality of parallel tube passes for cooling high pressure refrigerant vapor in an air conditioning system for the motor vehicle and for cooling engine coolant having air centers bonded thereto for cooling fluid flow through said parallel tube passes comprising:

said parallel tube passes each including a flow tube with

aligned segments forming a refrigerant passage and a separate coolant passage;

a pair of unitary tank and header units; each of said unitary tanks and header units including a coolant space communicating with said coolant passages for flow of coolant therethrough;

each of said unitary tank and header units including a high pressure refrigerant space for communicating said refrigerant passages with a mechanical refrigerant system for directing refrigerant vapor through said refrigerant passages for condensation therein;

an internal partition in each of said unitary tank and header units extending the length thereof to separate said coolant space from said high pressure refrigerant space; and

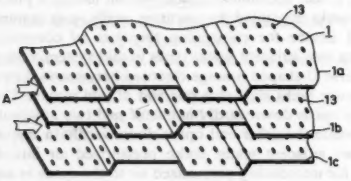
air center means connected to each of said aligned flow tube segments for conductively transferring heat from said cooiant and said refrigerant vapor.

5,009,263

HEAT-EXCHANGER UTILIZING PRESSURE DIFFERENTIAL

Yuu Seshimo, and Masao Fujii, both of Hyogo, Japan, assignors to Mitsubishi Denki K. K., Tokyo, Japan

Filed Dec. 11, 1985, Ser. No. 807,911
Claims priority, application Japan, Dec. 14, 1984, 59-264087
Int. Cl.[5] F28D *1/04*
U.S. Cl. 165—151 **28 Claims**



1. A heat exchanger apparatus comprising: a heat transmission member having a plurality of through-holes, said heat transmission member extending in a direction of fluid flow and being corrugated in the direction of fluid flow in the form of alternating trapezoids to produce a pressure difference between opposite surfaces of each of plural portions of said heat transmitting member; and main flow guide means for guiding a main portion of said fluid flow such that it does not pass through said through-holes but flows along said heat transmitting member.

5,009,264

WELL PRODUCTION APPARATUS INCLUDING PUMP MEANS AND THERMAL ABSORPTION MEANS

Kris M. Sliger, Denver, Colo.; Randolph C. Moeller, Casper, Wyo., and Scott E. Williamson, Castle Rock, Colo., assignors to Baker Hughes Incorporated, Houston, Tex.

Filed May 23, 1990, Ser. No. 527,748
Int. Cl.[5] E21B *33/128*
U.S. Cl. 166—106 **6 Claims**

1. A well production apparatus, comprising:

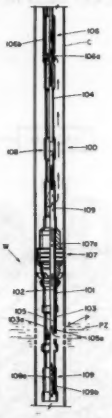
(1) a tubular production conduit extending from the top of the well to a production zone and disposed within casing in said well;

(2) an electric submersible pump on said conduit, said pump having a production fluid flow passageway extending therethrough and communication between the exterior of said conduit immediate said pump and the interior of said casing;

(3) a packer assembly in communication with said production conduit below said pump and positionable into sealing engagement with said casing to isolate said production zone from a portion of the well thereabove; and

(4) thermal absorption means on said production conduit between upper and lower production conduit members secured thereto whereby, subsequent to positioning of said packer assembly into sealing engagement with said casing, thermal expansion or contraction of said conduit above said packer assembly is absorbed by said thermal absorption means without transmission of said thermal expansion or contraction of said conduit to said pump

the thermal absorption means comprising first and second housing members, said first housing member being secured to said upper production conduit member and



said second housing member being secured to said lower production conduit member, one of said housing members defining a slot therethrough for receipt of lug means carried on the other housing member, said lug means and said slot when in a first position relative to one another preventing axial rotation between said upper and lower production conduit members and being movable by manipulation of said tubular production conduit to another position whereby said upper and lower production conduit members are movable longitudinally in telescopic relationship.

5,009,265

PACKER FOR WELLHEAD REPAIR UNIT

Thomas F. Bailey, Houston; Charles E. Lancaster, Iola, and Richard Lee, The Woodlands, all of Tex., assignors to Drilex Systems, Inc., Houston, Tex.

Filed Sep. 7, 1989, Ser. No. 404,159
Int. Cl.[5] E21B *23/06, 33/12*
U.S. Cl. 166—118 **24 Claims**

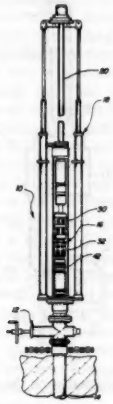
1. A well packer mechanically settable and retrievable within a well bore using a running tool to selectively isolate the wellhead, ssid packer comprising:

an inner mandrel;

a sleeve assembly movably mounted to said inner mandrel, said sleeve assembly selectively adjustable along said mandrel for longitudinal movement of said mandrel in a first direction relative to said sleeve assembly to set said packer; and

locking ratchet means for selectively preventing longitudinal movement of said mandrel in a second direction relative to said sleeve assembly thereby preventing release of said packer, said locking ratchet means including a first ratchet nut movable to a preset position as said packer is run into the well bore and a second ratchet nut said ratchet means being selectively disengageable to allow longitudinal movement of said mandrel in said second

direction relative to said sleeve assembly to unset said packer for retrieval thereof;



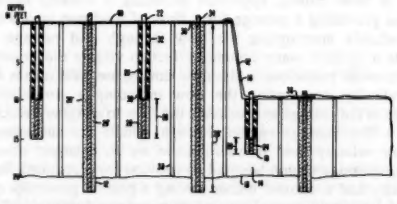
said sleeve assembly including at least one packing element selectively compressible into sealing engagement with the well bore and at least one slip selectively engageable with the well bore to set said packer within the well bore.

5,009,266

METHOD FOR IN SITU CONTAMINANT EXTRACTION FROM SOIL

Douglas K. Dieter, San Ramon, Calif., assignor to Solvent Services, Inc.,, San Jose and Amit Nagpal, Monte Sereno, both of, Calif., part interest to each

Filed Aug. 15, 1989, Ser. No. 394,391
Int. Cl.[5] E21B *43/24, 43/30, 43/34*
U.S. Cl. 166—245 **27 Claims**



1. A method for recovering mobilizable contaminants from a zone comprised primarily of porous layers of soil, said method comprising the steps of:

(a) pulsatilely injecting heated pressurized steam into a first location in the zone so as to uniformly heat targeted soil in the zone to steam temperature forming a steam condensation front encircling the zone of soil in the first location, and

(b) withdrawing the contaminants under subatmospheric pressure from the soil at a second location in the zone below the first location.

5,009,267

METHOD FOR TEMPORARILY REDUCING PERMEABILITY OF SUBTERRANEAN FORMATIONS

Charles D. Williamson, Houston; Stephan J. Allenson, Richmond, and Robert K. Gabel, Houston, all of Tex., assignors to Nalco Chemical Company, Naperville, Ill.

Division of Ser. No. 272,237, Nov. 14, 1988. This application Sep. 7, 1990, Ser. No. 578,883
Int. Cl.[5] E21B *43/27*
U.S. Cl. 166—271 **14 Claims**

1. An improved method for hydraulic fracturing of subterranean formations penetrated by a wellbore comprising:

dispersing in a fracturing media a fluid loss additive to form an improved fracturing media, said fluid loss additive comprising a blend of two or more modified starches; and

pumping the improved fracturing media into a wellbore at a pressure sufficient to lift the overburden and fracture the formation,

whereby a filter cake with low permeability will be rapidly formed, said filter cake being readily degraded after completion of the fracturing process.

5,009,268

METHOD OF USING A COMBINATION LIGNOSULFONATE/POLYALKYLENE GLYCOL SYSTEM AS A SACRIFICIAL AGENT FOR SURFACTANT FLOODING

George Kalfoglou, Houston, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Jan. 2, 1990, Ser. No. 459,611
Int. Cl.[5] E21B *43/22*
U.S. Cl. 166—274 **8 Claims**

1. A method of recovering hydrocarbons from a subterranean hydrocarbon formation which is penetrated by at least one injection well and at least one production well wherein a surfactant system is injected into the formation to sweep oil through the formation to at least one production well, which comprises:

injecting into the formation a surfactant solution containing about 0.11% to about 10% by weight of a mixture of at least two sacrificial agents designed to prevent the loss to the formation of injected chemicals of a surfactant solution,

said mixture of at least two sacrificial agents comprised of about 0.1% to about 5% by weight of a lignosulfonate and about 0.01% to about 5% by weight of a polyalkylene glycol having a molecular weight less than about 2000.

5,009,269

WELL CEMENT FLUID LOSS ADDITIVE AND METHOD

Larry K. Moran, and Thomas R. Murray, both of Ponca City, Okla., assignors to Conoco Inc., Ponca City, Okla.

Filed Jul. 31, 1990, Ser. No. 560,533
Int. Cl.[5] E21B *33/14*
U.S. Cl. 166—293 **4 Claims**

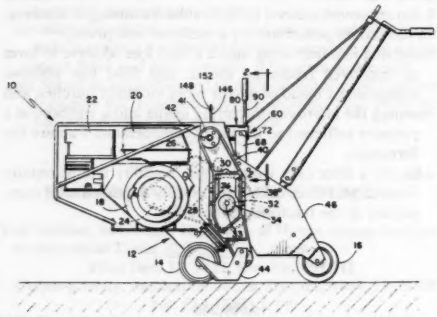
1. A method of cementing a casing in a wellbore comprising pumping a cement slurry into the annulus between said casing and said wellbore, said cement slurry containing from 0.2 to 2.0 percent by weight, based on the weight of cement solids in said slurry, of an additive consisting essentially of from 30 to 80 percent by weight of partially hydrolyzed high molecular weight vinyl acetate polymer, calcium sulfate in an amount equivalent to from 10 to 60 percent by weight of calcium sulfate hemihydrate, up to 5 percent by weight of a cross-linking compound for said polyvinyl acetate, and from 0 to 5 percent by weight of defoamer.

5,009,270

EARTHWORKING MACHINE WITH SINGLE HANDLE FOR ADJUSTING AND LOCKING BLADE DEPTH

Kip S. Vangsgard, White Bear Lake, Minn., assignor to Turfco Manufacturing, Incorporated, Minneapolis, Minn.

Filed Feb. 15, 1990, Ser. No. 480,587
Int. Cl.[5] A01B *45/04, 63/26*
U.S. Cl. 172—42 14 Claims



1. An earthworking machine comprising blade means mounted for oscillatory and vertical movement, power means for oscillating said blade means, movably mounted first gear means including a plurality of teeth fixedly mounted second gear means including a plurality of teeth and means including a single handle movable in first and second generally opposite directions for vertically adjusting said blade means and said movably mounted first gear means, and in third and fourth generally opposite directions for locking and unlocking said blade means in a vertically adjusted position, said third and fourth opposite directions being generally transverse to said first and second opposite directions, and said third generally opposite direction causing engagement of said first gear means with said second gear means to lock said blade means in a vertically adjusted position and said fourth generally opposite direction causing disengagement of said first gear means from said second gear means to unlock said blade means from a vertically adjusted position.

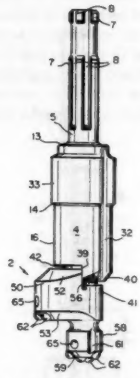
5,009,271

DRILL ASSEMBLY

Milan Maric, Box 1, Site 32, R.R. #4, Calgary, Alberta, Canada T2M 4H4 , and John I. Kulas, 2620 Signal Hill Drive S.W., Calgary, Alberta, Canada T3H 2T7

Filed Jul. 16, 1990, Ser. No. 552,921
Int. Cl.[5] E21D *1/00*
U.S. Cl. 175—53 10 Claims

1. A drill assembly comprising mandrel means for rotatable mounting in a casing shoe at the bottom end of a drill string; bit means for rotatable mounting in said mandrel means beneath the bottom end of the drill string, said bit means and mandrel means normally rotating together in one direction with said bit means eccentric with respect to said mandrel means, whereby the bit means can bore a hole larger in diameter than the casing shoe; head means on said bit means for engaging a formation to stop rotation of said bit means; shoulder means on said bit means and said mandrel means for retaining said bit means in the eccentric drilling position; and cam means on said bit means for engaging said casing shoe when the bit means is moved upwardly against the casing shoe to cause said bit means to rotate in the other direction to a release position in



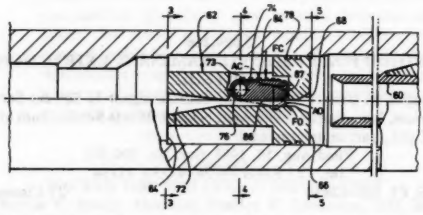
which said bit means is aligned with the casing shoe for movement therethrough.

5,009,272

FLOW PULSING METHOD AND APPARATUS FOR DRILL STRING

Bruno H. Walter, Edmonton, Canada, assignor to Intech International, Inc., Edmonton, Canada

Filed Nov. 15, 1989, Ser. No. 436,603
Claims priority, application Canada, Nov. 25, 1988, 584145; Jun. 22, 1989, 603594
Int. Cl.[5] E21B *7/18, 7/24, 4/14, 31/113*
U.S. Cl. 175—56 24 Claims



1. A flow pulsing apparatus including a housing having means providing a passage for a flow of fluid and means for periodically interrupting the flow through said passage to create a cyclical water-hammer effect to vibrate the housing and provide pulsations in the flow during use, said means for periodically interrupting the flow including a constriction means in the passage to accelerate the flow to a higher velocity and a first passage region through which the accelerated higher velocity fluid flows followed by an enlarged downstream passage region adapted to provide for a reduced fluid velocity and a control means having a pair of generally opposed faces, said control means being associated with said first passage region and being movable between a substantially open full-flow position and a substantially closed flow interrupting position, said control means, in use, having one of said faces at least partially exposed to the higher velocity fluid flow provided by said first passage region such that (a) when the control means is in the open position the higher velocity fluid flow tends to reduce the pressure force acting on at least a portion of said one face and (b) when the control means is in the closed position the flow interruption creates a fluid pressure force increase acting on at least a portion of said one face while the other of said faces of the control means is, in use, at

least partially exposed to the fluid pressures existing in said downstream passage region with said control means thus tending to be moved rapidly or to vibrate between the substantially open and substantially closed positions under the influence of the alternating differential pressure forces acting on said opposed faces of the control means during use.

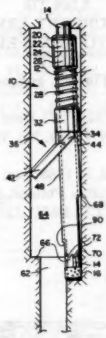
18. A flow pulsing method including flowing a fluid through a passage while periodically interrupting the flow to create pulsations in the flow and a cyclical water-hammer effect, characterized by passing the fluid through a constriction means in the passage to accelerate the flow to a higher velocity and thence into a first passage region through which the accelerated higher velocity fluid flows and thereafter passing the fluid through a downstream passage region arranged to reduce the fluid velocity, there being a control means having generally opposed faces, which control means is associated with said first passage region and is movable between a generally open full-flow position and a closed generally flow interrupting position, and exposing one face of said control means to the higher velocity fluid flow in said first passage region while the opposing face thereof is exposed to the fluid pressure existing in said downstream passage region of lower fluid velocity so that said control means tends to be moved rapidly or to vibrate between the generally open and closed positions by virtue of alternating differential pressure forces arising from Bernoulli and water-hammer effects acting on said generally opposed faces of the control member.

5,009,273

DEFLECTION APPARATUS

Piotr Grabinski, Calgary, Canada, assignor to Foothills Diamond Coring (1980) Ltd., Calgary, Canada

Filed Jan. 9, 1989, Ser. No. 295,144
Int. Cl.[5] E21B *7/04*
U.S. Cl. 175—61 **20 Claims**



1. A deflection apparatus for use in directional drilling comprising:

a housing which is adapted to be disposed about a drill string and to be rotatable relative to said drill string and to be moveable longitudinally of said drill string;

a deflection member pivotally connected to said housing and moveable between a first equilibrium position in which said member is in a retracted position adjacent said housing and a second position in which said member is biased toward an extended position outwardly of said housing;

means for maintaining said member in said first equilibrium position;

means responsive to an externally-imposed force for releasing said member from said equilibrium position; and

means, independent of the externally-imposed force, for biasing said deflection member into said extended position;

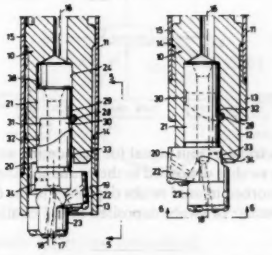
and wherein said means for biasing is responsive to said release of said deflection member from said first equilibrium position to move said deflection member toward said second position.

5,009,274

LATERALLY ADJUSTABLE DRILLING TOOL

Stig U. Löf, Sunne, Sweden, assignor to Uniroc Aktiebolag, Fagersta, Sweden

Filed Apr. 3, 1990, Ser. No. 503,724
Claims priority, application Sweden, Apr. 5, 1989, 8901198
Int. Cl.[5] E21B *10/66*
U.S. Cl. 175—260 **10 Claims**



1. A drilling tool for drilling in earth and in rock covered by overburden concurrently with a casing tube (**11**) following the drilling tool downhole, said tool incorporating a guide member (**10**) rotatably centered in said casing tube (**11**) at the mouth thereof, a drill bit (**20**) having a shaft (**21**) integral with an intermediate laterally projecting eccentric bit (**22**) and an axially protruding frontal pilot bit (**23**), said shaft (**21**) being journalled in an eccentrically disposed bore (**24**) in said guide member (**10**) to move relative thereto pivotally and axially between, on the one hand, a drilling position wherein the pilot bit (**23**) is coaxial with the guide member (**10**) and the eccentric bit (**22**) projects laterally beyond the casing tube (**11**) so as to drill a hole larger than said casing tube (**11**), and, on the other hand, a retracted position in which the drill bit (**20**) can be retracted and lowered through the casing tube (**11**), said drilling tool being c h a r a c t e r i s e d b y cooperating cam and follower means (**30,31,32;28**) between said shaft (**21**) and said guide member (**10**) wherein:

(a) the drill bit (**20**) is maintained in the drilling position thereof form-bound adjacent to the guide member (**10**) so as to be movable in axial direction in unison therewith,

(b) the guide member (**10**) by a form-restricted angular displacement relative to the drill bit (**20**) away from said drilling position is freed to perform a form-restricted axial movement backward and forward relative to the drill bit (**20**), and

(c) the guide member (**10**) in said backward position thereof by a form-restricted continued angular displacement relative to the drill bit (**20**) away from said drilling position is again maintained form-bound to the drill bit (**20**) for axial movement in unison therewith with the drill bit (**20**) in retracted position spaced in front of the guide member (**10**).

5,009,275

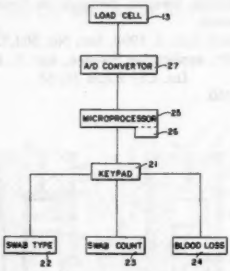
MEDICAL SWAB WEIGHING APPARATUS

James Sheehan, The Hermitage, Blackrock, County Dublin, Ireland

Filed Nov. 22, 1989, Ser. No. 440,972
Claims priority, application Ireland, Nov. 24, 1988, 3527/88
Int. Cl.[5] G01G *19/42, 19/52*
U.S. Cl. 177—25.13 **8 Claims**

1. A medical swab weighing apparatus, comprising a container into which used swabs may be deposited during the course of an operation, and a weighing means on which the container is removably support and which provides an electri-

cal output signal whose value is dependent upon the instantaneous total weight of the container and contents, the weighing means having means for storing the weight of a dry swab and program means responsive to the stored weight of a dry swab



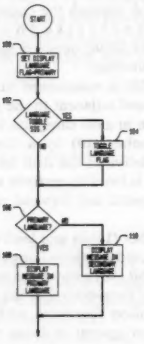
and the electrical output signal for calculating and displaying, each time a swab is deposited in the container, the total weight of blood absorbed in used swabs deposited in the container and the total number of swabs deposited in the container.

5,009,276

ELECTRONIC POSTAL SCALE WITH MULTILINGUAL OPERATOR PROMPTS AND REPORT HEADINGS

Terry E. Raikes, Santa Rosa; William L. Kramer, Windsor; John B. Howard, Forestville, all of Calif.; Wayne D. Moore, North York, Canada; Louis Jackson, Milford, Conn., and Jeffrey D. Kotecki, Newtown, Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Jan. 16, 1990, Ser. No. 466,120
Int. Cl.[5] G01G *19/40*; G06F *15/20*
U.S. Cl. 177—25.15 **16 Claims**



1. A postal scale comprising:

(a) weight sensing means for generating a weight signal;

(b) input means for generating a language select signal;

(c) output means for outputting texts;

(d) a memory for storing texts, said texts comprising a plurality of sets of texts, each of said sets being in a different language; and

(e) a microprocessor programmed to:

(i) receive and process said weight signal;

(ii) receive said language select signal;

(iii) select one of said sets of texts in accordance with said language select signal; and

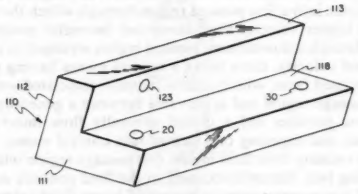
(iv) cause said output means to output texts from said selected set.

5,009,277

METHOD AND APPARATUS FOR POSITION DETERMINATION

Seymour J. Sindeband, Pound Ridge, N.Y., and Robert Butler, Milford, Conn., assignors to Science Accessories Corp., Stratford, Conn.

Filed Mar. 19, 1990, Ser. No. 495,330
Int. Cl.[5] G08C *21/00*
U.S. Cl. 178—18 **16 Claims**



5. Apparatus for obtaining and outputting the position of a moveable element in a data space, comprising:

an acoustic digitizer subsystem for determining the position of said movable element by measuring the transit time of acoustic wave energy traveling, in either direction, between said movable element and a plurality of known locations;

means for outputting said position measurement values;

means for computing the distance between determined time sequential positions of the movable element; and

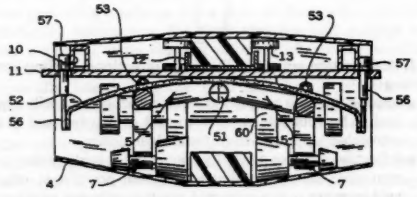
means for disabling the outputting of said position measurement values when said computed distance is outside a predetermined range.

5,009,278

METHOD AND A SUPPORT ARRANGEMENT IN A ROLLER VEHICLE TO BE STEERED BY A ROLLER MAT

Timo Laakso, Tuusula, Finland, assignor to 3TL Trading Co., Hyrylä , Finland

PCT No. PCT/FI88/00114, § 371 Date Mar. 26, 1990, § 102(e) Date Mar. 26, 1990, PCT Pub. No. WO89/01893, PCT Pub. Date Mar. 9, 1989
PCT Filed Jul. 8, 1988, Ser. No. 466,422
Claims priority, application Finland, Sep. 2, 1987, 873816
Int. Cl.[5] B62D *55/07*
U.S. Cl. 180—9.44 **16 Claims**



1. A support arrangement in a roller vehicle for steering thereof, including:

a turnover roller mat **4**;

a rigid body part **1** for supporting a power engine **2** and transmission means **3** for transmitting a driving force directly to an outer periphery of said roller mat **4** movable around a turnable wheel assembly **6**, **7** under said rigid body part **1**;

a support arrangement **5** extending the whole length of said body part **1** and suspended therefrom, said support arrangement including a separate, twistable auxiliary body

5, 5' supported by said body part 1 at two points on a center line of said vehicle;

said roller wheel assembly 6, 7 being suspended by said auxiliary body 5, 5';

said auxiliary body being provided with means 8, 9 connected to steering means for said vehicle for twisting said auxiliary body 5, 5' for steering said vehicle;

said auxiliary body including two flexible, telescopically lengthening rod means, the length of said rod means being at a minimum extent when said auxiliary body is in a unfolded balance state;

said auxiliary body 5, 5' being connected to said body part 1 by several parallel and spaced downwardly directed support rods 52 transverse to a longitudinal axis of said vehicle passing through a center of gravity of said vehicle defining a longitudinal center line thereof, each of said rods being supported to maintain the transverse position thereof at three points to the body part 1;

said auxiliary body 5, 5' being suspended to each support rod 52 by at least two thrust bearings 53, so that when said auxiliary body 5' is twisted it can move on said thrust bearings 53 along said transverse support rods 52, whereby on one side of said roller mat 4, the distance between said roller wheels 6, 7 and said body part 1 is shorter and on the other side of said roller mat 4 the distance between the roller wheels 6, 7 and the body part 1 becomes correspondingly longer, so that the roller mat 4 is displaced from a direct driving position to a curved driving position, at the same time when the center of gravity of the vehicle transfers from a side towards which said vehicle tilts on one side of the longitudinal center line of the vehicle to a side on the other side of the longitudinal center line of said vehicle, whereat said roller mat 4 is closer to said body part 1.

5,009,279

METHOD AND SYSTEM FOR DETECTING WHEEL SLIPPAGE

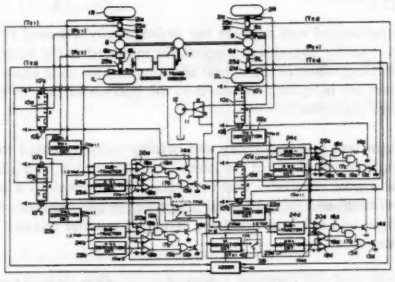
Toshiro Matsuda, Sagamihara, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Oct. 14, 1986, Ser. No. 918,125

Claims priority, application Japan, Oct. 11, 1985, 60-224936

Int. Cl.[5] B60K *28/16*

U.S. Cl. 180—197 **14 Claims**



1. A system for detecting wheel slippage comprising:

a first sensor for monitoring wheel rotation and producing a first sensor signal indicative of the wheel speed;

a second sensor for monitoring a parameter reflecting road surface friction and producing a second sensor signal indicative thereof;

a reference signal generator for sampling said first sensor signal having at a given timing and generating a reference signal having a value reflecting a projected vehicle speed based on the sampled first sensor signal value; and

an arithmetic means for modifying said reference signal value based on said second sensor signal value and comparing said first sensor signal value with the modified reference signal value so as to detect occurrences of wheel slippage.

5,009,280

ACOUSTIC APPARATUS

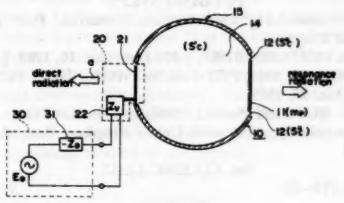
Kenji Yokoyama, Hamamatsu, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan

Filed Mar. 24, 1989, Ser. No. 328,473

Claims priority, application Japan, Apr. 1, 1988, 63-81032; Apr. 1, 1988, 63-81033

Int. Cl.[5] H04R *1/28, 3/04*

U.S. Cl. 181—160 **8 Claims**



1. An acoustic apparatus, comprising:

a body portion having an internal cavity therein defining a resonator and a passive diaphragm operatively coupled to said body portion, wherein said passive diaphragm functions as a resonance radiation unit for radiating an acoustic wave caused by resonance;

a vibrator disposed in the body portion and having an active diaphragm including a direct radiation portion for directly radiating can acoustic wave and a resonator driver portion for driving said resonator; and

vibrator drive means for driving said vibrator, said vibrator drive means being coupled to said vibrator and comprising drive control means for controlling a drive condition of said vibrator, wherein an atmospheric counteraction of said resonator is substantially cancelled at a time of driving of said resonator by said vibrator.

5,009,281

ACOUSTIC APPARATUS

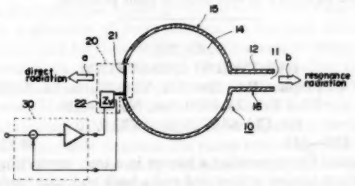
Kenji Yokoyama, Hamamatsu, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan

Filed Mar. 1, 1989, Ser. No. 317,952

Claims priority, application Japan, Mar. 10, 1988, 63-56905; Mar. 10, 1988, 63-56906

Int. Cl.[5] H04R *7/00*

U.S. Cl. 181—160 **9 Claims**



1. An acoustic apparatus comprising:

a body portion having an internal cavity therein defining a resonator and having a port therein forming a resonance radiation unit for radiating an acoustic wave by resonance;

a vibrator disposed in the body portion and having a diaphragm, including a direct radiation portion for directly radiating an acoustic wave outwards from the resonator and a resonator driver portion for driving said resonator, the driving of the resonator tending to produce counter-

acting air movement from the cavity of the body portion upon the diaphragm; and

a vibrator drive means having a motional feedback means responsive to movement of said diaphragm for producing a motional signal corresponding to movement of said diaphragm and negatively feeding back the motional signal to the vibrator drive means, said vibrator drive means responding to the negatively fed back motional signal from the motional feedback means to effect motional feedback driving of said vibrator in a manner which substantially cancels counteracting air movement from the cavity of the body portion upon the diaphragm.

5,009,282

FOLDING STEPS

Philip Willsher, 21, Afan Terrace, Cwmavon, Port Talbot, United Kingdom

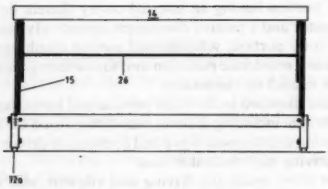
PCT No. PCT/GB88/01085, § 371 Date Oct. 10, 1989, § 102(e) Date Oct. 10, 1989, PCT Pub. No. WO89/05390, PCT Pub. Date Jun. 15, 1989

PCT Filed Dec. 12, 1988, Ser. No. 424,218

Claims priority, application United Kingdom, Dec. 10, 1987, 8728893

Int. Cl.[5] E06C *1/387*

U.S. Cl. 182—88 **9 Claims**



1. A folding step structure, which comprises:

(a) an elongate base member adapted to be laid on or parallel to a ground surface;

(b) a frame structure connected to said base member;

(c) a step member connected to said frame structure such that said frame structure and said step member are together pivotal, about pivot points towards one end of said base member, between a first limit position in which said step member is disposed substantially parallel to, and closely spaced from, said ground surface at a location towards the other end of said base member, in which limit positions said frame structure is in close juxtaposition to said base member, and a second limit position in which said step member is supported substantially parallel to said ground surface and substantially spaced above said base member; and

(d) securing means for securing said step member and said frame structure in said second limit position.

5,009,283

HUNTING STAND SYSTEM

Leonard W. Prejean, P.O. Box 529, Ville Platte, La. 70586

Filed Feb. 23, 1990, Ser. No. 484,220

Int. Cl.[5] A45F *3/26*; A47C *9/10*

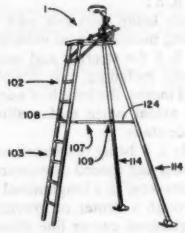
U.S. Cl. 182—116 **39 Claims**

1. A stand for supporting a hunter in a tree, comprising:

a platform having a front end and a back end, said back end having means for traction on said tree;

a climbing bar assembly having a first end and second end connected to said platform, said climbing bar assembly forming a loop extending past said back end of said platform and positioned to engage said tree at a height above said platform;

a seat assembly having a post pivotally connected at one end to said platform, a seat connected to an opposite end of said post, said seat assembly being adjustable from an upright position to a collapsed position relative to said platform; and



means connected to said seat assembly for engaging said hunter's feet when said seat assembly is in a collapsed position.

5,009,284

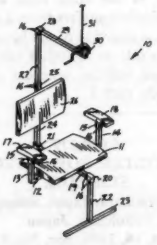
CHAIR LIFT APPARATUS

Sherrill A. Authement, Sr., P.O. Box 77, Cameron, La. 70631

Filed Jul. 9, 1990, Ser. No. 550,057

Int. Cl.[5] A45F *3/26*; A47C *9/10*; A01M *31/02*

U.S. Cl. 182—142 **6 Claims**



1. A chair lift apparatus comprising, in combination,

a seat platform, the seat platform including a bottom surface and a top surface, the bottom surface including a lateral seat support bar extending beyond opposed sides of the seat platform,

and

a longitudinal seat support bar orthogonally oriented relative to the lateral seat support bar mounted to the bottom surface, wherein the lateral and longitudinal so at support bars are integrally mounted to the bottom surface of the seat platform,

and

a right arm post integrally and orthogonally mounted to a right terminal end of the lateral seat support bar, and a left arm post integrally and orthogonally mounted to a left terminal end of the lateral seat support bar, wherein the right and left arm posts are arranged parallel relative to one another,

and

a right arm rest platform mounted to an upper terminal end of the right arm post, and a left arm rest platform mounted to an upper terminal end of the left arm post, wherein the right and left arm rest platforms are pivotally mounted to the respective right and left arm posts,

and

the longitudinal seat support bar including a forward "L" shaped yoke mounted at a forward terminal end of the longitudinal seat support bar,

and

a rear "L" shaped yoke mounted to a rear terminal end of the longitudinal seat support bar,

and

a forward leg post mounted to the forward "L" shaped yoke and orthogonally oriented relative to the longitudinal seat support bar in a first position and arranged to overlie in inter-folded relationship the longitudinal seat support bar in a second position, wherein the forward "L" shaped yoke permits selective pivotment of the forward leg post relative to the longitudinal seat support bar,

and

a forward leg post support bar integrally and orthogonally mounted to the forward leg post,

and

a lower spine link mounted to the rear "L" shaped yoke, wherein the rear "L" shaped yoke permits pivotment of the lower spine link from a first position orthogonally oriented relative to the longitudinal seat support bar to a second position to overlie the upper surface of the seat platform in a second position of the lower spine link,

and

a back support plate mounted integrally and orthogonally to a forward surface of the lower spine link,

and

an upper spine link including an upper spine link lower yoke pivotally mounting the upper spine link relative to the lower spine link from a longitudinally aligned first position of the upper spine link to the lower spine link to an overlying orientation of the upper spine link relative to the lower spine link in an upper spine link second position,

and

an upper spine link "L" shaped yoke orthogonally mounting an overhead link in a first position, wherein the overhead link is arranged parallel to the longitudinal seat support bar in the first position,

and

a winch mounted to a forward terminal end of the overhead link, wherein the winch includes an elongate cable mounted thereto for securement to a structural support member permitting elevational repositioning of the apparatus upon selective extension or retraction of the cable.

5,009,285

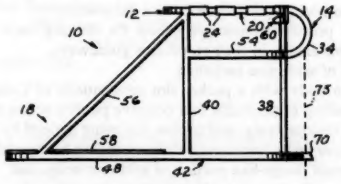
COMBINATION BACKPACK AND TREE STAND

E. Don Ramsey, Rte. 1, Box 247, Konawa, Okla. 74849

Filed May 21, 1990, Ser. No. 525,824

Int. Cl.[5] A01M *31/02*

U.S. Cl. 182—187 **3 Claims**



1. A backpack and tree stand, comprising:

an endless seat frame having a seat thereon and having a rearward end rail;

a chain connected at its respective end portions with respective end portions of said rearward seat end rail for transversely surrounding an intermediate portion of an upright support for securing said seat frame to the latter;

chain stop means including a planar member having outer and inward surfaces and having a forwardly open normally horizontal slot therein secured to opposite sides of said seat frame for receiving a selected intermediate link of said chain and securing respective end portions of said chain against longitudinal movement relative to the seat frame;

a chain link stop on the inward surface of said planar member adjacent the slot for preventing removal of a chain link from the slot while the chain is under tension;

a transverse horizontal frame member spaced downwardly with respect to said seat frame rearward end rail;

a pair of semicircular cams projecting rearwardly from said seat rearward end rail,

each said cam of said pair of cams secured in laterally spaced-apart parallel relation to the central portion of said seat frame rearward end rail and said transverse frame member and having a rearwardly projecting arcuate portion normally disposed downwardly with respect to the normally horizontal plane of the seat for forming a fulcrum and a binding action of said pair of cams against said upright support and supporting said seat in a substantially horizontal plane when said seat is biased downward by the mass of a hunter thereon; and,

elongated prong means secured to the seat frame and said transverse frame member and projecting rearwardly and downwardly coextensive with the seat frame and rearward extent of the cam means for contacting said support and stabilizing said seat frame against lateral movement relative to said support.

5,009,286

LUBRICATING OIL SUPPLYING MECHANISM IN SWASH PLATE TYPE COMPRESSOR

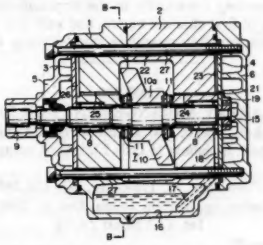
Hayato Ikeda; Masahiro Sawada; Norihiko Nakamura, and Naoya Yokomachi, all of Kariya, Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakushi, Aichi, Japan

Filed Dec. 4, 1989, Ser. No. 445,409

Claims priority, application Japan, Dec. 2, 1988, 63-306370

Int. Cl.[5] F01M *1/00*

U.S. Cl. 184—6.17 **6 Claims**



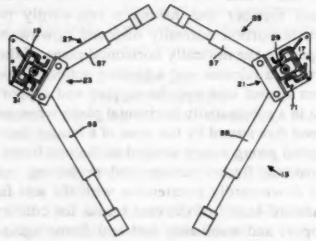
1. Lubricating oil supplying mechanism in a swash plate type compressor having a drive shaft set in a substantially horizontal plane, a swash plate fixed to the drive shaft, a cylinder block provided with a swash plate chamber receiving the swash plate, front and rear housings closing both ends of the cylinder block, a plurality of bolts arranged in through holes in the cylinder block for fastening the front and rear housings and the cylinder block, radial bearings rotatably journaling the drive shaft, trust bearings mounted between ends of a boss portion of the swash plate and the cylinder block, an oil reservoir holding the lubricating oil, and a pump unit for supplying the lubricating oil to movable elements, the pump unit being positioned at one end of the drive shaft, characterized in that at least one through hole of said cylinder block in which one of said plurality of bolts is arranged, which through hole is positioned above the horizontal plane on which the drive shaft lies is connected with a channel formed in said cylinder block from said pump unit to said through hole and with an outlet portions of a passage of said lubricating oil, the outlet portion opening into said swash plate chamber for discharging said lubricating oil to lubricate said movable elements, the outlet portion being positioned above the horizontal plane on which said drive shaft lies.

5,009,287

VEHICLE LIFT

George N. Starr, Memphis, Tenn., assignor to Delaware Capital Formation, Inc., Wilmington, Del.

Filed Sep. 19, 1989, Ser. No. 409,438
Int. Cl.[5] B60S *13/00*
U.S. Cl. 187—8.41 11 Claims



1. A vehicle lift comprising:

(a) support means for engaging a vehicle to be lifted, said support means including at least one carriage means and lift arm means, said carriage means including follower means;

(b) power means engaging said support means for lifting, supporting and lowering said support means to lift, support and lower a vehicle engaged by said support means; and

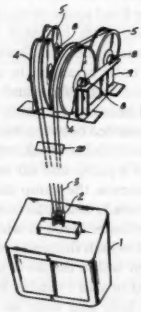
(c) at least one vertically extending column means for supporting and guiding said support means during said lifting, supporting and lowering thereof; said column means including a pair of first channel means opening inwardly towards said carriage and a pair of second channel means respectively joined to said first channel means and respectively opening outwardly in the opposite direction from said pair of first channel means, and said pair of first channel means movably receiving said follower means.

5,009,288

SHEAVE ARRAY ARRANGEMENT FOR ELEVATOR

Keiichiro Nakai, Tokyo, and Yoshinori Nakanishi, Shibayama, both of Japan, assignors to Otis Elevator Company, Farmington, Conn.

Filed Nov. 14, 1989, Ser. No. 436,269
Claims priority, application Japan, Dec. 9, 1988, 63-311541
Int. Cl.[5] B66B *11/04*
U.S. Cl. 187—20 3 Claims



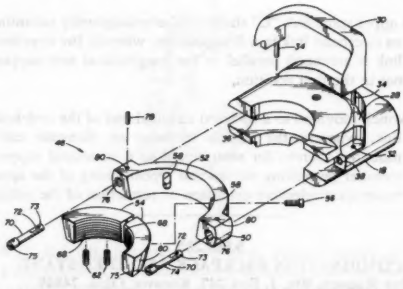
1. A sheave array for use in an elevator system for guiding counterweight and car ropes, said array comprising: a first sheave pair having parallel axes of rotation, one sheave of said first sheave pair guiding ropes attached to a first side portion of the counterweight, and the other sheave of said first sheave pair guiding ropes attached to said car in the vicinity of a vertical line passing through the center of gravity of the car; and a second sheave pair having parallel axes of rotation, the axes of rotation of said second sheave pair being skew to the axes of rotation of said first sheave pair, one sheave of said second sheave pair guiding ropes attached to a side portion of the counterweight opposite said first side portion, and the other sheave of said second sheave pair guiding ropes attached to the car in the vicinity of said vertical line.

5,009,289

BLOWOUT PREVENTER STRING SUPPORT

James G. Nance, Spring, Tex., assignor to Cooper Industries, Inc., Houston, Tex.

Filed Mar. 23, 1987, Ser. No. 28,743
Int. Cl.[5] E21B *33/06*
U.S. Cl. 188—67 12 Claims



1. An apparatus for supporting a tubular string within a well bore, comprising

a body having means for connecting to a wellhead structure, a central bore therethrough an opposed, aligned guideways extending outward from the central bore,

a ram positioned in each of said guideways,

fluid pressure responsive means for moving each of said rams axially in their respective guideways,

each of said rams including

a ram body with a packer slot substantially of C-shape extending horizontally in a concave pattern across the face of the ram body, said packer slot being defined by both an upper and a lower outwardly extending horizontally positioned flange-like portion of said ram body, and

a pipe gripping assembly including

a bowl body shaped to be received in said packer slot with the interior of said bowl body facing said central bore and having an arcuate surface which tapers downwardly and inwardly,

fastening means for fixedly securing said bowl body within said packer slot,

a plurality of gripping members with each of said gripping members having a rear surface tapered to mate with said arcuate tapered surface of said bowl body, and

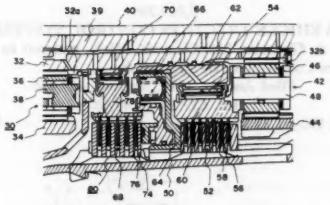
means for slidably mounting said gripping members within said bowl body for movement along said tapered bowl surface in a vertical direction,

each of said gripping members having a plurality of gripping teeth on the face thereof.

5,009,290
MULTI-DISK BRAKE FOR AUTOMATIC TRANSMISSION

Kyouji Harada; Eiji Kato; Yoshikazu Sakaguchi; Kazuaki Watanabe, and Akira Hoshino, all of Aichi, Japan, assignors to Aisin-AW Kabushiki Kaisha and Toyota Jidosha Kabushiki Kaisha, both of, Japan

Filed Aug. 4, 1989, Ser. No. 389,590
Claims priority, application Japan, Aug. 6, 1988, 63-195307
Int. Cl.[5] F16H *5/00*
U.S. Cl. 188—71.5 **19 Claims**



1. A multi-disc brake for an automatic transmission, comprising:

(a) a cylindrical case having a splined inner peripheral surface and a central axis;

(b) a plurality of annular outer lamellae having a first diameter and concentrically arranged along the axis of said cylindrical case and splined to said inner peripheral surface with an annular gap therebetween;

(c) a plurality of annular inner lamellae having a second diameter smaller than said first diameter and concentrically arranged along the axis of said cylindrical case, said outer and inner lamellae being alternatively interleaved;

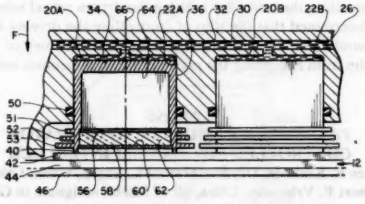
(d) an engagement/disengagement mechanism capable of pressing said outer and inner lamellae together into frictional engagement and capable of disengaging and releasing said outer and inner lamellae from each other; and

(e) spring means, inserted into the lowermost portion of said annular gap beneath said outer lamellae, for applying a spring loading on said outer lamellae to bias said outer lamellae upward in said case.

5,009,291
BRAKE PISTON ASSEMBLY

Thomas P. Castellano, Malibu, Calif., assignor to Industrial Material Technology, Inc., Andover, Mass.

Filed Jun. 14, 1988, Ser. No. 206,600
Int. Cl.[5] F16D *65/84*
U.S. Cl. 188—71.6 **7 Claims**



1. An actuator apparatus for use in a brake system having a first disc element which is to be pressed against another disc element, comprising:

walls forming a cylinder;

a piston slideably mounted in said cylinder to move in a predetermined forward direction toward said disc element and in an opposite rearward direction;

means for applying pressured hydraulic fluid to said cylinder to push said piston in said forward direction;

a seal between said piston and cylinder for preventing the leakage of said hydraulic fluid;

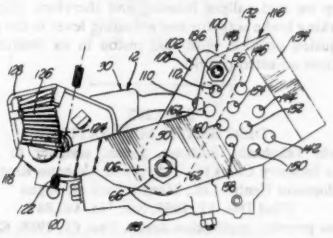
said piston having a rear wall against which said hydraulic fluid presses, a substantially cylindrical side wall which seals against said seal, and a forward end that presses toward said disc element;

said piston also having first and second forward internal walls forming a sealed chamber between them within said cylindrical side wall at a location forward of said seal, and a quantity of a coolant material which is generally a liquid under temperatures reached in braking, lying in said chamber wherein said coolant material has a specific heat at least half that of sodium.

5,009,292
MECHANISM AND METHOD OF POSITIVE ARCUATE ORIENTATION OF A FIRST MEMBER AND A SECOND MEMBER, PARTICULARLY FOR BRAKE ADJUSTED ORIENTATION OF A DRIVE MEMBER AND A DRIVEN MEMBER IN A DISC BRAKE ASSEMBLY HAVING PARKING BRAKE MECHANISM

Chalres T. Hoffman, Jr., Springboro; Ralph A. Gordon, Centerville, both of Ohio; Thomas P. Hosmer, Concord, and Robert M. Lucas, Melrose, both of Mass., assignors to General Motors Corporation, Detroit, Mich.

Filed May 19, 1989, Ser. No. 355,012
Int. Cl.[5] F16D *65/38*
U.S. Cl. 188—71.7 **2 Claims**



1. In a disc brake assembly having a caliper housing with a parking brake lever stop defining a released position for a parking brake lever, a piston, and a parking brake actuator including a parking brake lever adapted to have parking brake cable means connected therewith for moving the parking brake actuator to move the piston mechanically to actuate the disc brake assembly as a parking brake:

mechanism for establishing a positive disc brake piston position with the parking brake lever positioned at its housing stop during the parking brake release mode and the piston is a desired axially proper adjusted position, said mechanism comprising:

a threaded shaft axially fixed with respect to said caliper housing forming a part of the piston brake actuator, said shaft being mounted for driving rotational movement in the caliper housing and having one end positioned within the caliper housing and threaded and receiving cooperating driven threaded means thereon to act on the piston to mechanically apply the brake assembly in the parking brake mode and to be positioned in the brake release mode to provide an axially adjusted position of said driven threaded means and therefore of the piston, said shaft having on its other end outward of the caliper housing a multi-equal sided non-circular cross section first portion having at least six sides, and said shaft having a second portion, and a threaded end in axial series alignment;

and a parking brake actuating lever assembly forming another part of the parking brake actuator including a first lever portion defined by an intermediate lever assembly portion and a second lever portion defined by the parking brake lever;

said first lever portion having a multi-equal sided non-circular cross section opening receiving said shaft first portion therethrough in any one of a plurality of arcuate positions relative to and in arcuately rotatable driving relation with said shaft and said first lever having at least three equally spaced holes radially aligned relative to said threaded shaft;

said second lever portion being spring biased to a released position and said second lever having an opening receiving said shaft second portion with said second lever portion upon such receipt being in translationally fixed but arcuately relatively movable relation to said shaft, and said second lever having at least three sets of equally spaced holes on concentric arcs for registration with said first lever holes, none of said holes on said second lever being radially aligned relative to said threaded shaft;

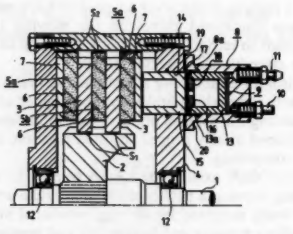
connector means joining said first and second lever portions in any one of a series of arcuately relative substantially equi-spaced positions by registration through aligned holes in said first and second levers and thereby establishing a selected fixed arcuate position of said second lever portion in relation to said shaft and a rotatably fixed driving relation between said second lever portion and said shaft through which said shaft may be operatively arcuately rotated by arcuate rotational movement of said second lever portion, the arcuate range of arcuately relative positions available between said shaft and said second lever portion being sufficient to incrementally orient said second lever portion arcuately on said shaft with the brake in the fully adjusted and released position and with said second lever portion engaging the second lever portion stop on said caliper housing and therefore placing said parking brake actuator and actuating lever in the properly adjusted position with said piston in its desired axially proper adjusted position.

5,009,293

DISC BRAKE APPARATUS

Nobuyuki Takahashi, Saitama, Japan, assignor to Akebono Brake Industry Co., Ltd., Tokyo and Akebono Research and Development Centre Ltd., Hanyu, both of, Japan

Filed Dec. 12, 1989, Ser. No. 448,847
Claims priority, application Japan, Dec. 21, 1988, 63-164472
Int. Cl.[5] F16D *55/18*
U.S. Cl. 188—72.4 **5 Claims**



1. A disc brake apparatus for a vehicle having a vehicle wheel, the apparatus comprising:

at least one rotor rotating with the vehicle wheel;

a housing provided on an unrotatable portion of the vehicle;

at least two pads supported by said housing, said pads being located at both sides of said rotor;

a cylinder comprising a flange having a plurality of apertures, aid cylinder secured to said housing by a plurality of threaded fasteners passing through said apertures to engage said flange;

a piston means engaging said cylinder for urging said pads against said rotor, said piston means comprising a main part fitted sealably in said cylinder and a sub-part slidably mounted in a circular aperture in the housing, said sub-part being provided between said main part and said pads, and a first heat-resistant member provided between said main part and said sub-part to prevent the transfer of heat from the sub-part to the main part, said main part, said first part and said sub-part to prevent the transfer of heat from the sub-part to the main part, said main part, said first heat-resistant member and said sub-part being arranged in series, said first heat resistant member completely separating said sub-part from said main part; and

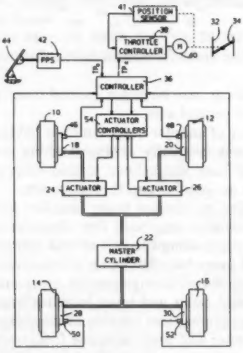
a second heat-resistant member provided between said cylinder and flange and said housing to prevent the transfer of heat from the housing to the cylinder.

5,009,294

VEHICLE TRACTION CONTROL SYSTEM

Youssef A. Ghoneim, Mt. Clemens, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jan. 19, 1990, Ser. No. 467,436
Int. Cl.[5] B60K *41/20*
U.S. Cl. 192—1.22 **4 Claims**



1. A traction control method for a vehicle having an engine for applying a driving torque to a driven wheel and having a brake for braking the driven wheel, the method comprising the steps of:

determining a wheel slip condition of the driven wheel;

controlling the driving torque applied to the driven wheel by the engine, when the determined wheel slip condition represents an excessive acceleration wheel slip condition, in direction to limit wheel slip to a desired slip value λ^*;

determining a condition where using only the step of controlling the driving torque would be incapable of preventing a trajectory of wheel slip from exceeding a predetermined maximum allowable slip value λ_x; and

controlling the brake for braking the driven wheel when it is determined that the step of controlling the driving torque would be incapable of preventing the trajectory of wheel slip from exceeding the predetermined maximum value λ_x.

5,009,295

TRANSMISSION SHIFTER TO OPERATOR CONTROLLED MECHANISM INTERLOCK

Charles E. Kinkade, Dryden; Harold L. Sharp, Union Lake, and Robert F. Vrbensky, Utica, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

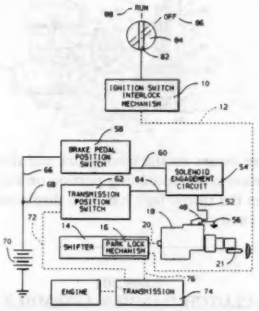
Filed Dec. 8, 1989, Ser. No. 447,778
Int. Cl.[5] B60K *41/26*
U.S. Cl. 192—4 A **1 Claim**

1. A shift control in an automatic transmission on a vehicle having at least one operator controlled mechanism to be manipulated prior to the transmission being shifted from a Park range comprising:

position selector means movable to control setting of said

transmission and having Park/Lock means for mechanically blocking the movement of said position selector means from said Park range until said Park/Lock means is released including

selectively energizable electromagnetic solenoid means for holding stationary said Park/Lock means and said position selector means when said transmission is in said Park range prior to manipulation of said operator controlled mechanism; and



said solenoid means providing travel stop means for said Park/Lock means when said position selector means is placed in said Park range and having an armature and a pole piece which are separated sufficiently to reduce the magnetic attraction therebetween to an ineffective level when the position selector means is moved from the Park range and the operator controlled mechanism is in the unmanipulated condition.

5,009,296

POWER TRANSMITTING APPARATUS FOR USE IN VEHICLE

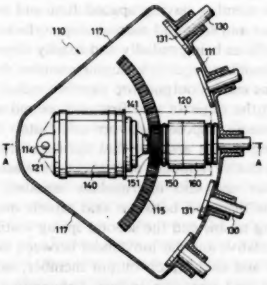
Osamu Ohkawa, Sakato; Tetsuya Tamahoko, Koganei, and Eisuke Imanaga, Tokyo, all of Japan, assignors to Tokyo Seat Co., Ltd., Asaka, Japan

Continuation-in-part of Ser. No. 135,948, Dec. 21, 1987, abandoned. This application Jun. 8, 1989, Ser. No. 366,195

Claims priority, application Japan, Dec. 24, 1986, 61-313567; Dec. 24, 1986, 61-313568; Dec. 24, 1986, 61-313569; Dec. 24, 1986, 61-313570; Dec. 24, 1986, 61-313571; Dec. 24, 1986, 61-313572

Int. Cl.[5] **B60N** *1/06;* **F16H** *19/04;* **F16D** *27/12*

U.S. Cl. 192—20 **6 Claims**



1. A power transmitting apparatus for use in a vehicle, comprising:

a motor having at least one output shaft to which a traveling electromagnetic clutch and at least one power-transmitting electromagnetic clutch are attached;

a plurality of clutch plates capable of being connected to said power-transmitting electromagnetic clutch while being aligned therewith; and

operating shafts fixed to said clutch plates;

wherein said power-transmitting electromagnetic clutch is moved by the operation of said traveling electromagnetic clutch and the rotation of said motor to a position at which said power-transmitting clutch can be connected to a desired one of said clutch plates.

5,009,297

ELECTROMAGNETIC CLUTCH HAVING A STRUCTURE FOR REDUCING IMPACT NOISE

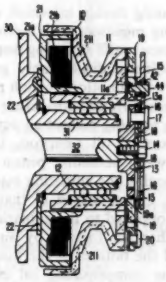
Hideyuki Gonda, Isesaki, Japan, assignor to Sanden Corporation, Isesaki, Japan

Filed Mar. 15, 1989, Ser. No. 323,961

Claims priority, application Japan, Mar. 15, 1988, 63-33099[U]

Int. Cl.[5] **F16D** *27/112, 27/14*

U.S. Cl. 192—84 C **18 Claims**



10. An electromagnetic clutch comprising:

a first rotatable member rotatably supported on a first bearing and having an axial magnetic end plate;

a second rotatable member which is rotatably supported;

an annular magnetic member connected to said second rotatable member through a plurality of leaf springs so as to be capable of axial movement, said annular magnetic member facing said axial magnetic end plate of said first rotatable member with an axial gap therebetween;

a third rotatable member connected to said second rotatable member to limit the axial movement of said annular magnetic member;

electromagnetic means associated with said first rotatable member for attracting said annular magnetic member to said axial magnetic end plate, said leaf springs being arranged to absorb rotational force when said second rotatable member is rotated with said first rotatable member;

coupling means for coupling said annular magnetic member to said third rotatable member; and

elastic means sandwiched between said coupling means and an outer end surface of said third rotatable member for reducing vibration and impact noise when said annular magnetic member is attracted to said axial magnetic end plate, said elastic means receiving substantially compression forces when said annular magnetic member is attracted to said axial magnetic end plate.

5,009,298

Patent Not Issued For This Number

5,009,299

CLUTCH ACTUATING DEVICE

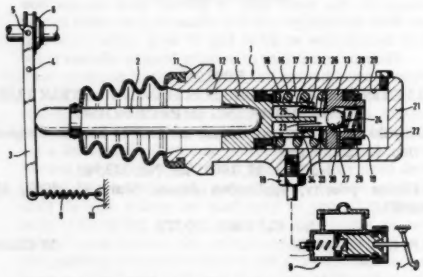
Hanns Seegers, Herzogenaurach, Fed. Rep. of Germany, assignor to INA Walzlager Schaeffler KG, Fed. Rep. of Germany

Filed Jan. 31, 1990, Ser. No. 472,721

Claims priority, application Fed. Rep. of Germany, Mar. 8, 1989, 3907341

Int. Cl.[5] F16D *25/02, 25/06*

U.S. Cl. 192—85 C 5 Claims



1. A clutch actuating device in which an actuating piston coupled via actuating members with a clutch release bearing and, at an axial distance to the actuating piston, a compensating piston are longitudinally displaceably guided in a hollow cylindrical housing with a bottom, which pistons are held at a distance by a pressure spring and together with a section of a cylinder wall of the housing delimit an actuating oil chamber connected to an external oil reservoir, the pressure spring being arranged between actuating piston and compensating piston and pre-tensioning the actuating piston in the direction of clutch actuation, characterized in that the compensating piston with its side opposed to the actuating piston delimits a compensating oil chamber formed by an inner wall of the hollow housing and the bottom of the housing, the actuating oil chamber and the compensating oil chamber being connected by an oil passage which is regulated both as a function of the distance between the pistons and of an operation of the clutch actuating device so that the length of the pressure spring does not change, or changes only slightly throughout the life of the clutch, the actuating oil chamber being connected with a pressure oil source and the actuating piston and the compensating piston being additionally coupled with each other in axial direction by connecting means which transfer only tensile forces.

5,009,300

ANTI-ROTATION DEVICE FOR THE RELEASE BEARING OF A MANUALLY OPERATED CLUTCH

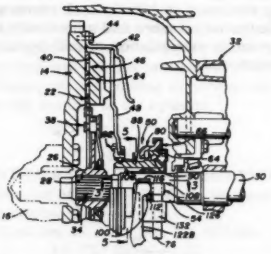
Kenneth L. Romig, Rochester, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 21, 1990, Ser. No. 496,721

Int. Cl.[5] F16D *23/14*

U.S. Cl. 192—98 4 Claims

1. A device adapted to establish a cooperative interface between at least one finger of a clutch throw fork and the mounting portion of a release bearing in a clutch assembly, one or more of the devices being mounted at selected locations along the circumference of a flange means extending radially outwardly from the mounting portion of the clutch release bearing, said device comprising: a substantially planar body portion having lateral edges with a transverse edge extending therebetween; first and second side flanges extending substantially perpendicularly outwardly from the lateral edges of said body portion to define a reaction cavity therebetween; at least one finger of a throw fork being cooperatively received within said reaction cavity; fastening clip means secured to at least one of said side flanges to embrace the flange means extending outwardly from the mounting portion of the clutch release bearing; and, a blocking paddle portion extending outwardly from, and in coplanar relation with, said body portion to engage the finger means on the throw fork and thereby serve to preclude rotation of the mounting portion on the release bearing even when the throw fork has been displaced from within said reaction cavity.



5,009,301

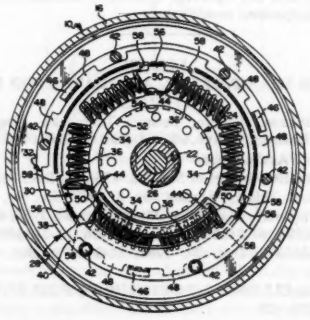
CLUTCH DAMPER ASSEMBLY

Wayne L. Spitler, Ludlow Falls, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Jun. 1, 1990, Ser. No. 531,612

Int. Cl.[5] F16D *3/14*

U.S. Cl. 192—106.2 2 Claims



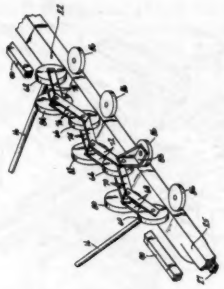
1. A clutch and damper comprising: a clutch input member having spring seating means and an input stop member; an intermediate member having spaced first and second spring seating means and first and second stop surfaces with one of said stop surfaces being radially and axially aligned with said input stop member; a clutch output member having spring seating means and an output stop member radially and axially aligned with the other of said first and second stop surfaces; first spring means disposed between said clutch input member spring seating means and the first spring seating means for permitting relative angular movement between said clutch input member and said intermediate member; and second spring means disposed between said clutch output member spring seating means and the second spring seating means for permitting relative angular movement between said intermediate member and said clutch output member, said input stop member and said one stop surface cooperating to limit the relative angular movement between said clutch input member and said intermediate member and said output stop member and said other stop member cooperating to limit the relative angular movement between said intermediate member and said clutch output member.

5,009,302

CURVED ESCALATOR WITH FIXED CENTER CONSTANT RADIUS PATH OF TRAVEL

Frank M. Sansevero, West Hartford, Conn., assignor to Otis Elevator Company, Farmington, Conn.

Division of Ser. No. 328,926, Mar. 27, 1989, Pat. No. 4,930,622.
This application Mar. 9, 1990, Ser. No. 490,885
Int. Cl.[5] B66B 21/02
U.S. Cl. 198—328 6 Claims



1. An escalator assembly having an arcuate path of travel defined by a constant radius derived from a fixed center as viewed in plan, the escalator including horizontal entry and exit landing zones, an intermediate constant slope zone, and entry and exit transition zones of continuously varying slope interconnecting the constant slope zone with the entry and exit landing zones respectively, said escalator having turnaround sprockets at each of said landing zones for reversing the direction of travel of the moving escalator components, and said escalator assembly including:

(a) track means extending between said landing zone and through said transition and constant slope zones for supporting movement of steps along the path of travel of the escalator;

(b) a plurality of steps, each having: an upper tread portion which remains substantially horizontal throughout a people transporting portion of the path of travel of the escalator; a step axle at radially inner and outer sides of each step; radially inner and outer step axle rollers rotatably mounted on said step axles, said step axle rollers being operable to travel over radially inner and outer portions of said track means;

(c) a radially outer step chain forming a continuous connection between said step axles whereby all of said steps are connected together at their radially outer sides throughout the entire path of travel of the escalator;

(d) means for continuously changing the effective length of said outer step chain, without changing the actual length of said outer step chain as the steps move through each of said transition zones by shortening the effective length of said outer step chain by forming kinks therein in said entry transition zone, and means for straightening the kinks in said exit transition zone whereby the effective length of said outer step chain separates the step axles of adjacent steps at a first predetermined greater distance in both of said landing zones, and separates the step axles of adjacent steps a second predetermined shorter distance, in said constant slope zone, so as to move the outer ends of the step axles of adjacent steps toward and away from each other in said transition zones while concurrently pivoting each step about a point corresponding substantially to its radially inner leading corner as the steps move through the transition zones, whereby the steps are continuously guided and properly positioned along said arcuate path of travel; and

(e) said outer step chain having an effective length which equals its actual length when engaging said turn around sprockets.

5,009,303

AUTOMATIC CASE ACCUMULATOR

Wayne Lutzke, Plymouth, Wis., assignor to Nigrelli Systems, Inc., Kiel, Wis.

Filed Feb. 6, 1989, Ser. No. 306,557
Int. Cl.[5] B65G 1/00
U.S. Cl. 198—347.3 8 Claims

1. An automatic case accumulator for selectively accumulating and discharging cases transported in a downstream direction by a conveyor comprising:

a. a frame;

b. a plurality of generally horizontal vertically spaced shelves extending generally parallel to the conveyor;

c. drive means connected to the frame for moving the shelves in a generally vertical plane located adjacent and parallel to the conveyor; and

d. finger means mounted to the shelves for being struck and pivoted within the vertical plane by the cases being transported in the downstream direction by the conveyor between consecutively spaced shelves to insert the finger means inside the cases and for cooperating with selected shelves to lift the cases from the conveyor without the cases tipping off the selected shelves.

5,009,304

MULTI-DIRECTIONAL DRIVE FOR ROLLER CONVEYORS OR SIMILAR

Ekkehard Schmalzl, Am Schlierbach 5, D-7860 Schopfheim, Fed. Rep. of Germany

Filed Mar. 13, 1990, Ser. No. 492,678
Claims priority, application Fed. Rep. of Germany, Mar. 17, 1989, 3908856
Int. Cl.[5] B65G 37/00
U.S. Cl. 198—372 3 Claims

1. Multi-directional drive for roller conveyors comprising a plurality of rolling elements **4**, **6** which are consecutively mounted on at least one powered shaft, the elements can rotate selectively in each of the longitudinal direction of the shaft or perpendicular thereto, characterized therein that

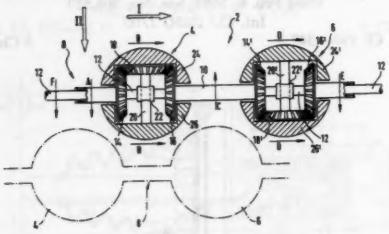
the shaft is formed as a hollow quill (**10**) and is intended to encompass coaxially an inner rotating shaft (**12**);

the quill (**10**) is discontinuous in the region of the rolling elements (**4**, **6**), forming two free, opposed faces there;

gearwheels (**14**, **16**) which are drivingly coupled together by means of an idle wheel (**18**) perpendicular to them, are mounted on the free faces of the quill such that they cannot rotate freely, where the rotational axis of the idle

wheel (18) intersects the longitudinal axis of the rotating shaft (12);

the rotary motion of each idle wheel (18) is transmitted to a plane of rotation which is axially symmetrical to the rotating shaft (12) relative to the plane of rotation of the idle wheel (18); and



that the rolling elements consist of two sub-elements (24, 26) which are located in both rotational planes, and the quill (10) can selectively rotate relative to the stationary rotating shaft (12).

5,009,305

ARTICLE ORIENTATORS

John W. Auld; Brian F. Stringer, both of St. Albans, England, and Brian F. Stringer, both of St. Albans, England, assignors to Noshe Engineering Limited, England

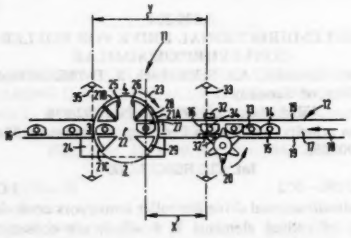
PCT No. PCT/GB88/00173, § 371 Date Sep. 12, 1989, § 102(e) Date Sep. 12, 1989, PCT Pub. No. WO88/07016, PCT Pub. Date Sep. 22, 1988

PCT Filed Mar. 8, 1988, Ser. No. 401,442

Claims priority, application United Kingdom, Mar. 12, 1987, 8705846

Int. Cl.[5] B65G *47/24*

U.S. Cl. 198—395 14 Claims



1. An article orientator for disposition above a conveyor for transporting articles, said orientator comprising a plurality of article holders independently supported to enable each holder to be moved into and out of the path of the conveyor and being operative to divert an article received by it out of the conveyor path and then back into it again with a changed orientation, the article holders being disposed to move around a common endless track in incremental movements, and the number of article holders disposed around said endless track being such as to leave a free track space around the track equal to at least one said incremental movement.

5,009,306

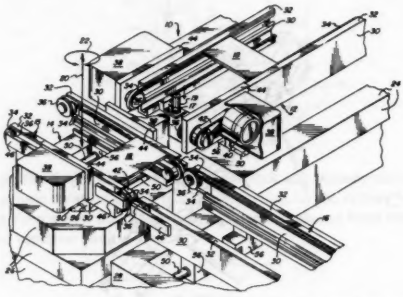
PRINTED CIRCUIT BOARD CONVEYOR AND METHOD

Zackary A. Roderick, Santa Cruz, and Leon A. Rode, Merced, both of Calif., assignors to Simplimatic Engineering Company, Lynchburg, Va.

Filed Jun. 19, 1989, Ser. No. 367,758

Int. Cl.[5] B65G *29/00*

U.S. Cl. 198—414 57 Claims



1. A conveyor support for conveyors having endless ropes which frictionally transport articles, the conveyor support comprising:

an elongated substantially vertical body having a top portion and a bottom portion;

a first platform depending substantially horizontally from a side of the body along its length at its top portion, the first platform having a top surface and a bottom surface;

a concavely shaped channel formed in the top surface of and running the length of the first platform, the channel to slidably support the endless rope from below to frictionally transport articles;

a second platform depending substantially horizontally from a side of the body along its length beneath the first platform, the second platform having a top surface and a bottom surface; and

a concavely shaped passage running the length of the second platform and bounded by the top surface of the second platform which is formed upward toward the bottom surface of the first platform and around toward the body to slidably support the returning rope from below.

5,009,307

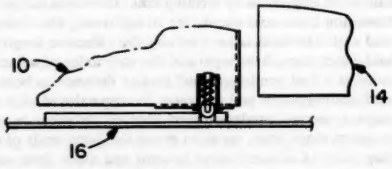
SAFETY DEVICE FOR CONVEYOR SYSTEMS

Lynn C. Chance, Woodstock, and John A. Low, Maurertown, both of Va., assignors to Agri-Tech Incorporated

Filed Jul. 14, 1989, Ser. No. 379,890

Int. Cl.[5] B65G *47/44*

U.S. Cl. 198—538 10 Claims



1. A conveyor system comprising:

(A) a conveying mechanism which moves in a direction of conveyance;

(B) first and second components of said conveyor system spaced adjacent to said conveying mechanism; and

(C) a spring biased fastener which directs a fastening force perpendicular to the direction of conveyance thereby to

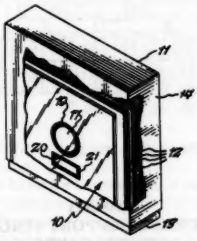
detachably connect said first component to said second component, wherein said fastener is adapted to release to disconnect said first component from said second component under the pressure of an object lodged between said conveying mechanism and said first component in order to prevent damage to said object.

5,009,308

CONTROLLED RATE ADSORBENT UNIT AND METHOD OF FABRICATION THEREOF

John S. Cullen, Buffalo; Samuel A. Incorvia, Tonawanda; Christopher S. Nigon, Orchard Park, and Nicholas E. Vaylen, Grand Island, all of N.Y., assignors to Multiform Desiccants, Inc., Buffalo, N.Y.

Filed Aug. 9, 1989, Ser. No. 391,775
Int. Cl.[5] B65D *81/26*
U.S. Cl. 206—204 **8 Claims**



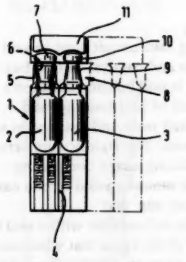
7. In combination a package, recording disc means in said package, and a controlled rate adsorbent unit in said package for adsorbing water vapor in said package at a controlled rate for maintaining the quality of said recording disc means, said controlled rate adsorbent unit being in the shape of a recording disc, said adsorbent unit including paper impregnated with a moisture adsorbent and completely encased and sealed within a plastic casing having a predetermined vapor transmission rate.

5,009,309

DOUBLE CHAMBER RECEPTACLE

Bernd Hansen, Heerstrasse 16, 7166 Sulbach-Laufen 2, Fed. Rep. of Germany

Filed Aug. 22, 1989, Ser. No. 396,929
Claims priority, application Fed. Rep. of Germany, Sep. 29, 1988, 3833036
Int. Cl.[5] B65D *3/04*
U.S. Cl. 206—219 **12 Claims**



1. A double chamber receptacle, particularly a double chamber ampoule, comprising:

first and second containers arranged side-by-side, adjacent to and generally parallel to each other and detachably coupled together by a frangible partition zone before opening and mixing contents thereof, said first and second containers having first and second chambers, respectively;

first and second stoppers closing said first and second containers, respectively;

a first neck on said first container having a filling-removing opening and a conical outer surface tapering toward an open end of said first neck; and

a second neck on said second container having a filling-removing opening and having a conical inner surface configured to mate with said conical outer surface and tapering toward an inside of said second container;

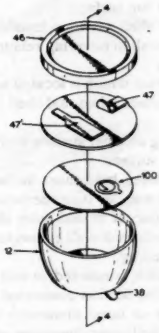
whereby the contents can be mixed by detaching said containers, removing said stoppers and inserting said first neck into said second neck.

5,009,310

DISPOSABLE CONTAINER FOR STORING AND DISPENSING PET FOOD

Patrick D. Finney, P.O. Box 658, Horsham, Pa. 19044

Filed Apr. 4, 1990, Ser. No. 503,907
Int. Cl.[5] B65D *69/00, 85/72*
U.S. Cl. 206—229 **2 Claims**



1. A disposable container for storing and dispensing pet food comprising:

(A) a monolithic circular outer shell having

(1) a base which has an outer dimension,

(2) a hollow tubular sidewall connected to said base and having an inner surface and an outer surface and a top rim spaced from said base, said top rim having an outer dimension that is greater than said base outer dimension so that said sidewall diverges from said base to form a bowl shape,

(3) said sidewall being folded over itself at said top rim and having a sidewall portion of said sidewall outer surface in contact with said sidewall inner surface, said sidewall portion extending from said top rim toward said base and having a terminal end located inside said outer shell, and

(4) said sidewall having an end edge at said terminal end which extends from said outer surface to said inner surface and slopes downwardly from said outer surface toward said base, said terminal end extending completely around said sidewall and defining a ledge, said ledge being triangular in shape with said terminal edge defining a hypotenuse, said ledge having a thickness as measured along the height dimension of said triangular shape;

(B) adhesive material on said base, said adhesive material having a thickness measured from said base and an outer dimension that is slightly smaller than said base outer dimension, said adhesive material releasably affixing said base to a support upon contact with such support;

(C) a protective covering having an inner surface releasably

attached to said adhesive material and covering said adhesive material, said protective covering having an outer surface and a thickness measured between said protective covering inner surface and said protective covering outer surface, and an outer dimension that exceeds the outer dimension of said adhesive material and is smaller than the outer dimension of said base, said protective covering further including a pull tab mounted on said protective covering outer surface;

(D) a sealing cover releasably affixed to said outer shell top rim, said sealing cover including

(1) a top surface,

(2) a bottom surface,

(3) said sealing cover having an outer dimension which exceeds the outer dimension of said outer shell adjacent to said top rim,

(4) adhesive means releasably affixing said sealing cover to said outer shell top rim,

(5) said sealing cover forming a flexible overhang which is outwardly circumjacent to said outer shell adjacent to said top rim,

(6) a pull tab mounted on said sealing covering top surface,

(7) a food stirring element releasably mounted on said sealing cover top surface;

(E) a monolithic shell cover releasably mounted on said outer shell sidewall in covering relation thereto, said shell cover including

(1) an inner surface which is located adjacent to said outer shell inner surface when said shell cover is mounted on said shell,

(2) a base having an inner surface with an inner dimension and an outer surface,

(3) said shell cover base inner surface inner dimension being slightly smaller than the outer dimension of said outer shell adjacent to said outer shell top rim,

(4) a flexible tubular sidewall connected to said shell cover base and including

(a) a first section connected to said shell cover base,

(b) a connecting section connected to said first section and having an inner dimension that is smaller than said outer shell outer dimension adjacent to said outer shell top rim,

(c) a third section connected to said connecting section,

(d) said connecting section being located to engage said outer shell adjacent to said outer shell top rim when said shell cover is mounted on said outer shell and flexing outwardly to accommodate said outer shell, and

(e) said shell cover tubular sidewall second section curving away from said shell sidewall and having an outer rim which is spaced from said outer shell sidewall when said shell cover is mounted on said outer shell, and

(5) an annular ridge on said shell cover base outer surface, said annular ridge including

(a) a planar top surface spaced from said shell cover base outer surface,

(b) a sloping wall extending from said planar top surface to said shell cover base outer surface and circumscribing an area therewithin on said shell cover base outer surface, said area having a dimension that is slightly greater than the outer dimension of said protective covering,

(c) said annular ridge having a height measured between said planar top surface and said cover base outer surface, and

(d) said annular ridge height exceeding the combined thickness of said adhesive and said protective covering; and

(F) a sealing plate which includes

(1) an upper surface having an outer dimension,

(2) a lower surface having an outer dimension, with said lower surface outer dimension exceeding said upper surface outer dimension,

(3) an edge connecting said upper surface to said lower surface, said edge being triangular in shape and being received in said outer shell ledge when said sealing plate is mounted on said outer shell,

(4) a pull ring element mounted on said sealing plate upper surface,

(5) said sealing plate lower surface outer dimension being less than the dimension of said outer shell adjacent to said ledge, and

(6) said sealing plate having a thickness measured between said sealing plate upper surface and said sealing plate lower surface, with said sealing plate thickness being equal to said ledge thickness.

5,009,311

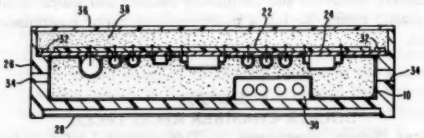
REMOVABLE RIGID SUPPORT STRUCTURE FOR CIRCUIT CARDS

Robert J. Schenk, 28 Valley View Ter., Wayne, N.J. 07470

Filed Jun. 11, 1990, Ser. No. 536,324

Int. Cl.[5] B65D *81/06*

U.S. Cl. 206—332 **5 Claims**



1. A method for adding structural rigidity during usage to a circuit card, comprising the steps of:

providing a walled housing in which said circuit card is to be mounted;

providing a sealable compliant bag;

filling said bag with resin and catalyst which when mixed together form a foam which expands and becomes rigid upon curing;

sealing said bag;

fixedly mounting said circuit card to said housing;

mixing said resin and catalyst in said bag;

placing said bag in said housing between a side of said circuit card and a wall of said housing; and

allowing the mixed resin and catalyst in said bag to cure.

4. An arrangement for rigidly supporting a circuit card within a housing during usage comprising:

means for fixedly mounting said circuit card to said housing;

a sealed compliant bag; and

a quantity of resin and catalyst within said bag, said resin and catalyst being of the types that when mixed together form a foam which expands and becomes rigid upon curing;

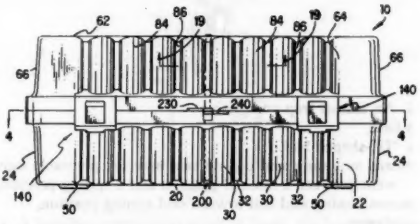
wherein said bag is supported within said housing between a side of said circuit card and a wall of said housing, the placement of said bag within said housing being effected after the resin and catalyst are mixed but before the resulting foam is cured.

5,009,312

CONTAINER AND IMPROVED METHOD FOR CARRYING AND TRANSPORTING COMPUTER TAPE CARTRIDGES

David G. Leben, 105 S. Broadway, Suite 640, Wichita, Kans. 67202

Continuation-in-part of Ser. No. 392,210, Aug. 10, 1989, which is a division of Ser. No. 287,739, Dec. 21, 1988, Pat. No. 4,874,088.
This application Oct. 10, 1989, Ser. No. 419,397
The portion of the term of this patent subsequent to Oct. 17, 2006, has been disclaimed.
Int. Cl.[5] B65D *25/18, 85/67*
U.S. Cl. 206—387 16 Claims



1. A container for carrying and transporting computer tape cartridges comprising

a container base having a base bottom, a pair of base hollow upright side walls integrally secured to said base bottom, and a pair of base end walls integrally secured to said base bottom and to said base side walls, each of said base hollow upright side walls having a base outside wall and a base inside wall with said base outside wall having a structure defining a plurality of hollow dome-shaped protrusions spaced by an abridging outside wall member and with said base inside wall having a structure defining a plurality of hollow dome-shaped ribs spaced by an abridging inside wall member, and said base bottom having a base outside wall and a base inside wall having a structure defining a plurality of hollow dome-shaped ridges spaced by an abridging base inside wall member, said dome-shaped ribs integrally connected to said dome-shaped ridges; and

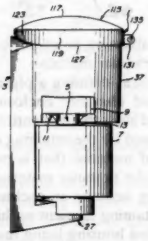
a container lid pivotally secured to said container base.

5,009,313

BATHROOM TISSUE DISPENSER (SPINDLE RELEASE)

Michel Morand, Montreal, Canada, assignor to Wyant & Company Limited, Lachine, Canada

Filed Feb. 15, 1990, Ser. No. 480,590
Claims priority, application United Kingdom, Aug. 16, 1989, 8918667
Int. Cl.[5] B65D *85/62*
U.S. Cl. 206—391 11 Claims



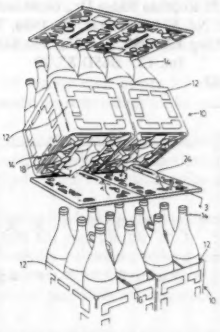
1. A two-roll toilet paper dispenser having a base with a bottom support arm and an upper enclosure; a spindle extending up from the bottom support arm into the enclosure; movable stop means provided on the spindle and positioned thereon to have space for a first toilet paper roll, consisting of a coil of paper wrapped on a core, rotatably mounted on the spindle and resting on the support arm beneath the stop means in a lower operative position; the stop means also positioned on the spindle to provide space for a second toilet paper roll, consisting of a coil of paper wrapped on a core, rotatably mounted on the spindle and resting on the stop means substantially enclosed by the enclosure in an upper storage position, and actuating means on the dispenser to move the stop means to permit the second roll to drop on the spindle from the storage position to the operating position when the paper coil of the first roll has been used up and its core removed.

5,009,314

BOTTLE CARRIER ASSEMBLY

Raymond C. Arthurs, Scarborough, Canada, assignor to Saepter Manufacturing Company Limited, Don Mills, Canada

Filed Jun. 30, 1989, Ser. No. 374,648
Int. Cl.[5] B65D *21/02, 1/24, 85/00*
U.S. Cl. 206—427 7 Claims



1. An assembly of adjacent bottle carriers, each formed of resilient plastic material and each of generally rectangular plan having a base, side walls, end walls and upstanding internal walls forming a plurality of bottle accommodating cells, and each carrier having a socket through the base extending upwardly between cells, and a tongue extending downwardly within the socket between the bottle carrying cells; and an assembly plate extending under said carriers and having upstanding prongs, a prong fitting into a corresponding socket of each carrier adjacent the tongue whereby, on peripheral pressure on the assembly the prong bears against the tongue to hold the plate against falling.

5,009,315

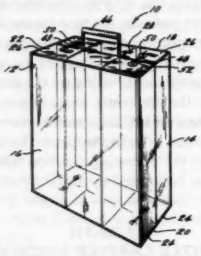
CONTAINER CARRIER

Douglas F. F. Robare, P.O. Box 172, Middlefield, Mass. 01243

Filed Jun. 29, 1990, Ser. No. 545,820
Int. Cl.[5] B65D *33/02, 30/22, 5/46*
U.S. Cl. 206—427 5 Claims

1. A container carrier for storing and transporting beverage cans and the like, said container comprising a box having a front wall, a back wall, two end walls, an openable bottom, an openable top, latch means associated with said top and with said bottom for holding said top and said bottom in a closed position, an insert disposed within said container for dividing the volume thereof into substantially equal portions and a handle for carrying said container disposed on said insert and extending from within said container to a point outside of said container, said openable top and openable bottom comprising a pair of flaps, one of said pair of flaps being hingedly connected

to said front wall and the other of said pair of flaps being hingedly connected to said back wall, said box being made of



a flexible, clear plastic material, said insert being made of a rigid plastic material.

5,009,316

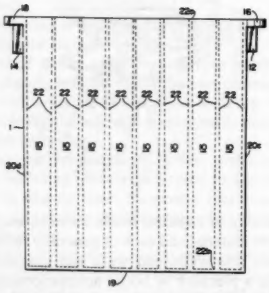
TEST TUBE CASSETTE SYSTEM AND CASSETTES FOR USE THEREIN

David C. Klein, 20 Redding Ridge Dr., Gaithersburg, Md. 20878

Division of Ser. No. 174,855, Mar. 29, 1988. This application May 12, 1989, Ser. No. 350,843

Int. Cl.[5] B65D *85/20*

U.S. Cl. 206—443 **16 Claims**



1. An asymmetrical test tube cassette for use in a cassette system, the cassette comprising:

a pair of spaced parallel exterior side walls having straight top, bottom and side edges;

a pair of parallel exterior end walls having straight top, bottom and end edges, the end walls being integrally connected to the side walls along the respective side edges of the end walls and side walls;

a planar exterior bottom wall extending between the bottom edges of the side walls and end walls, the side walls, end walls and bottom walls together defining a fluid-tight cassette chamber with an opening defined by the straight top edges of the side walls and end walls;

a plurality of dividing walls, the dividing walls being integrally formed with the side walls and bottom walls and extending within the chamber between the side walls so as to divide the chamber into a plurality of fluid-tight test tubes, each test tube defined by two planar end walls and two planar side walls, each test tube side wall being a portion of the cassette side wall and each test tube having a substantially rectangular cross-section; and

a planar rear extension extending from one end of the cassette and a planar front extension extending from the other end of the cassette, the front and rear extensions having different shapes such that the cassette is asymmetric so as to aid in proper placement of the cassette in the cassette system.

5,009,317

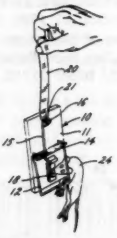
ANIMAL TRAP WITH SANITARY HANDLING MEANS

William J. Kist, 337 Roberts Rd., Barrington, Ill. 60010

Filed Sep. 19, 1990, Ser. No. 585,250

Int. Cl.[5] B65D *73/00*

U.S. Cl. 206—466 **12 Claims**



1. An animal trap comprising

a base,

a "U"-shaped bail,

means mounting said bail on said base for pivotable movement between a latched position and a sprung position,

means biasing said bail toward said sprung position,

a trigger,

latch mounted on said base for releasable engagement with said trigger for maintaining said bail in said latched position, and

a flexible handle normally extending in upright relation to said base so as not to impede access to said trigger by a mouse nor movement of said bail from said latched to said sprung positions, said handle being bendable so as to permit handling and transport of said trap by grasping an upper end of said handle with said base and a mouse trapped thereon suspended in depending relation from a lower end of said handle.

5,009,318

METHOD, DEVICE AND PADDED PRODUCT FOR MAINTAINING AN OBJECT

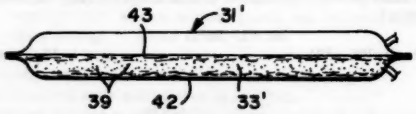
Dominique Lepinoy, Dijon, France, assignor to Lepinoy Industrie, Dijon, France

Continuation of Ser. No. 139,254, filed as PCT FR87/00115 on Apr. 8, 1987, published as WO87/06209 on Oct. 22, 1987, abandoned. This application Mar. 9, 1990, Ser. No. 492,251

Claims priority, application France, Apr. 9, 1986, 86 05317; Aug. 26, 1986, 86 12091

Int. Cl.[5] B65D *81/20*

U.S. Cl. 206—524.8 **11 Claims**



1. A device for cushioning an object comprising:

(a) a quantity of granular material;

(b) a retaining element defining a plurality of closed chambers, each closed chamber enclosing a portion of the granular material such that the entire quantity of granular material is enclosed by the retaining element the retaining element made of material that is permeable to gas and impermeable to the granular material;

(c) a sealed housing defining an enclosed inner volume and enclosing the retaining element within the enclosed inner volume, the sealed housing being made of a supple material impermeable to gas; and

(d) means to depressurize the enclosed inner volume of the sealed housing, the retaining element preventing any ex-

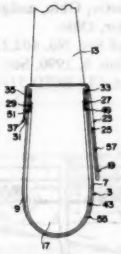
cessive accumulation of the granular material in a particular part of the enclosed inner volume before depressurization.

5,009,319

SHAPE GIVING SYSTEM FOR SOFT PURSES

Ellen E. Jantzen, 1226F Woodchase La., St. Louis, Mo. 63017

Filed Oct. 2, 1987, Ser. No. 104,822
Int. Cl.[5] A45C *1/00, 3/08, 11/20, 13/02*
U.S. Cl. 206—544 21 Claims



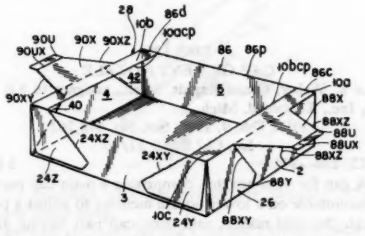
1. A handbag comprising a fabric body, the body having a bottom, sides and an openable mouth, and a liner in the body, the liner being formed to fit snugly against at least two sides of the body, first quick-connect means on the inside of the at least two sides of the body and second quick-connect means on the liner for cooperating with the first quick connect means for releasably holding the liner, a third quick-connect means on the outside of at least one of said two sides of the body, flap means for covering the mouth of the body, and fourth quick-connect means for cooperating with the third quick connect means for releasably holding the flap means to the body, the handbag further including a flexible, resilient sheet shaped to pull the body taut to define a shaped handbag, the body of the handbag comprising pockets on the inside of the two sides of the body adjacent the mouth, the pockets holding the ends of the resilient sheet, the first quick-connect means being provided on the pockets.

5,009,320

PACKAGING CARTON

William I. Kramer, 103 Briarcliff Dr., Ossining, N.Y. 10562

Filed Oct. 31, 1990, Ser. No. 607,242
Int. Cl.[5] B65D *5/54*
U.S. Cl. 206—607 20 Claims



1. A carton for containing food suitable for microwaving, comprising:

a pair of spaced end walls coupled with a base;

a top closure wall including coupled thereto a side wall for each said end wall of said pair of end walls adapted to fit over said pair of end walls;

perforation means on each of said side walls for dividing said side walls into first and second portions; and

sealing means for sealing said side walls to said end walls and leaving said second portions partially free of sealing engagement with said end walls;

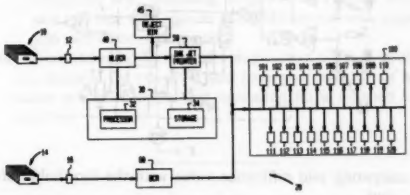
said perforation means enabling said second portions to be separated from said first portions to form handles for supporting said carton.

5,009,321

SORTING SYSTEM FOR ORGANIZING RANDOMLY ORDERED ROUTE GROUPED MAIL IN DELIVERY ORDER SEQUENCE

Laurence J. Keough, Fairfield, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Nov. 13, 1989, Ser. No. 434,734
Int. Cl.[5] B07C *5/02*
U.S. Cl. 209—3.1 10 Claims



1. A system for sorting mail pieces for delivery by a mail carrier in a sequence corresponding to the mail carrier's route comprising:

a. means for storing a database containing a delivery sequence for each address on the carrier's route;

b. means for feeding the mail pieces to be delivered by the carrier;

c. means coupled to the feeding means for reading an address on each of said fed mail pieces;

d. means, operatively connected to said reading means and said storing means, for determining a sorting sequence representative of said delivery sequence for each of the mail pieces;

e. means for printing on each of the mail pieces a sequence code corresponding to said sorting sequence;

f. sort means operatively connected to said determining means for depositing the mail pieces into sorting bins inn accordance with said sorting sequence wherein number of passes through said sort means and number of sorting bins needed to complete the sorting of the mailpieces always depends on the formula $X=Y^n$, where X equals a maximum number of stops on the letter carrier's route, Y equals the number of said sorting bins in the sorting system and n equals number of passes through the sorting system to complete the sort, the formula holding true for any number of stops.

5,009,322

PROCESS AND APPARATUS FOR CHECKING/SEPARATING OUT CIGARETTES

Heinz Focke, Verden, and Jürgen Süssenguth, Lilienthal, both of Fed. Rep. of Germany, assignors to Focke & Co. (GmbH & Co.), Verden, Fed. Rep. of Germany

Filed Apr. 5, 1988, Ser. No. 177,737
Int. Cl.[5] B07C *5/12*
U.S. Cl. 209—536 6 Claims

1. Process for checking, in a contactless manner, cigarettes filled with tobacco, comprising the steps of:

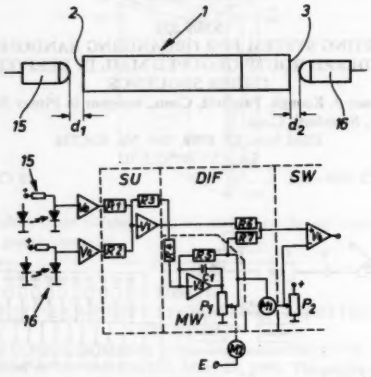
measuring two distance values between two axial end faces of an individual cigarette and two respective reference points and producing two corresponding measuring signals;

obtaining a current sum value of said two distance values;

averaging a plurality of sum values of previous measurements for obtaining a sum average value'

obtaining a difference value between said sum average value and said current sum value;

determining a threshold value in accordance with the color of said tobacco;



comparing said difference value with the threshold value; and

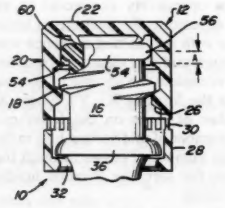
generating an error signal for use in separating said individual cigarette from said cigarettes when said difference value is above the threshold value.

5,009,323

TAMPER INDICATING CLOSURE HAVING A ROTARY SEAL

Gary V. Montgomery, and Terry E. Beck, both of Evansville, Ind., assignors to Sunbeam Plastics Corporation, Evansville, Ind.

Filed Nov. 13, 1989, Ser. No. 435,261
Int. Cl.[5] B65D *41/34*
U.S. Cl. 215—252 **10 Claims**



1. A threaded tamper indicating closure for use on a container having a threaded neck and stop means below its threads, said closure comprising:

a cap having a top and an annular skirt depending from said top with internal threads complementary to said container threads;

a tamper indicating band spaced from the bottom of said cylindrical skirt and connected thereto by a plurality of circumferentially spaced axially extending frangible webs;

engagement means on said band which permits rotation of said band with said cap as said cap is being threaded onto said container by allowing said engagement means to pass over said container stop means to the point where said closure is fully threaded onto said container neck where said engagement means is spaced from said container stop means, said engagement means contacting said stop means as said cap is being unthreaded, and said webs are stretched to their fracture point by retention of said engagement means by said container stop means; and

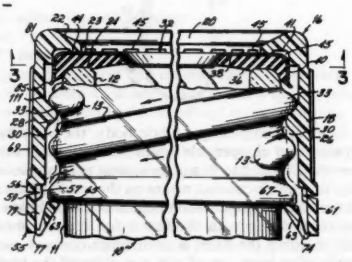
a rotary sealing member on said cap in the form of a cylindrical surface on said annular cap skirt which maintains sealing contact with an outwardly extending bead on said container neck until after said cap has been unthreaded to the point where said webs fracture.

5,009,324

CLOSURE HAVING THERMALLY RESPONSIVE WATER WASHING SLOTS

Charles S. Ochs, Lancaster, Ohio, assignor to Anchor Hocking Corporation, Lancaster, Ohio

Continuation-in-part of Ser. No. 402,211, Sep. 1, 1989. This application Jun. 8, 1990, Ser. No. 535,400
Int. Cl.[5] B65D *51/16*
U.S. Cl. 215—276 **10 Claims**



1. A closure having a top, a skirt depending from said top, cooperating securing means on an inside surface of said skirt and on a container to secure the closure on said container, passages in said closure for conducting wash water from said top downwardly to a space between the securing means of the closure and container so that said securing means can be washed while said closure is secured on a container, and

temperature responsive passage blocking means in said passages, said blocking means normally closing said passages to the ingress of foreign particles from the top of said closure toward said securing means,

said blocking means being responsive by thermal expansion to open during hot water washing, so that wash water can flow past said blocking means to wash said securing means.

5,009,325

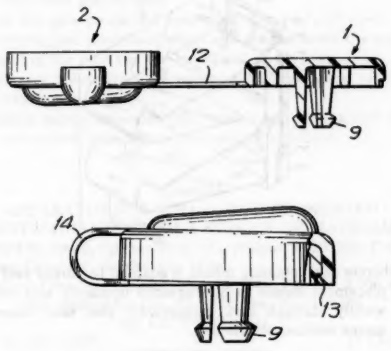
CAP OF VENT NOZZLE

Walter K. Weber, Grand Rapids, Mich., assignor to KB Lighting, Inc., Kentwood, Mich.

Filed Feb. 9, 1990, Ser. No. 478,262
Int. Cl.[5] B65D *51/16*
U.S. Cl. 220—374 **5 Claims**

1. A cap for vent nozzles, comprising a main cap part turnably mountable on a lower nozzle member to adjust a passage through the vent nozzle, said main cap part having an inlet opening formed to communicate with an ambient atmosphere and allow air to come into the lower nozzle member and then into an interior of a device to be vented; an auxiliary cap part connected with said main cap part and provided with a passage and an outlet opening communicating with said passage, said auxiliary part being formed so that it is fittable on said main cap part so that in a fitted condition said passage communicates with said inlet opening of said main cap part and said outlet opening of said auxiliary cap apart faces toward an interior of

the vent nozzle in a direction opposite to said inlet opening of said main cap part; a flexible element connecting said main cap



part and said auxiliary part with one another permitting said auxiliary part to be turned and fitted on said main cap part.

5,009,326

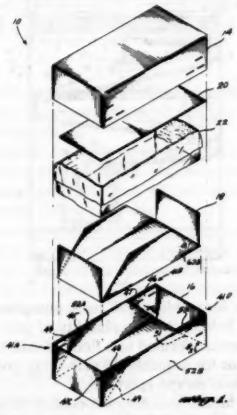
INSULATED CONTAINER SYSTEM FOR SHIPPING PERISHABLE PRODUCTS

Thomas A. Reaves, and John S. Sherritt, both of Anchorage, Ak., assignors to Premier Industries, Inc., Tacoma, Wash.

Continuation of Ser. No. 325,677, Mar. 17, 1989, abandoned. This application Jul. 18, 1990, Ser. No. 554,183

Int. Cl.[5] B65D *77/00*

U.S. Cl. 220—441 **17 Claims**



1. An insulated container system for shipping perishable products comprising:

(a) an outer container having a top and a bottom, each of said top and said bottom comprising a rectangular sheet of container material, said rectangular sheets of container material folded such that said top has a substantially rectangular ceiling and said bottom has a substantially rectangular floor, such that said ceiling and said floor are encompassed by side walls and end walls and such that said top and said bottom have regions composed of a single layer of said container material, said top and said bottom having corners formed by inwardly folded sections of said rectangular sheets, said inwardly folded sections being fastened to single layered portions of said top and said bottom thereby forming multilayered regions;

(b) a one-piece insulating liner formed of an unbacked, separate single sheet of foam insulating material for covering said single layered regions of said bottom of said outer container when said one-piece insulating liner is inserted into said bottom but not said multilayered regions, said one-piece insulating liner comprising:

(i) a rectangular floor region;

(ii) two side wall regions; and,

(iii) two end wall regions, said two side wall regions and said two end wall regions being unitarily joined together with said floor region such that said two side wall regions and said two end wall regions form an integral structure with said floor region, said one-piece insulating liner including compression creases where said two side wall regions and said two end wall regions join said floor region; and,

(c) an insulating lid formed of a single sheet of foam insulating material for covering said ceiling of said top of said outer container when said insulating lid is inserted into said top.

5,009,327

TOWEL OR CLOTH CONTAINER

Barrie Levison, 39 Beaumont Ave., St. Albans, Herts AL1 4TW, England

Filed May 3, 1990, Ser. No. 518,187

Claims priority, application United Kingdom, Dec. 5, 1989, 8927452

Int. Cl.[5] A45C *11/00*

U.S. Cl. 220—890 **3 Claims**

1. A container for a towel, cloth and the like, comprising a tubular enclosure having one closed end and the other end defining an access opening, an elongate flexible member which slidably extends through an aperture in the wall of the enclosure at said closed end, means for attaching the flexible member at its inner end to the towel, stop means at the outer end of the flexible member whereby the towel can be readily deployed for use from a stowed condition within the container by a distance limited by the stop means on the flexible member, the towel has a substantially circular periphery and is attached to the flexible member substantially at its center so that when retracted into the enclosure it collapses through said access opening of the enclosure into said stowed condition somewhat like the material covering of an umbrella; a tapered collar provided at the inner end of the flexible member for sealing the enclosure aperture when the towel is in said stowed condition, and a flange and cooperating washer plate provided on said collar between which surrounding material of the towel can be sandwiched for its ready attachment and release.

5,009,328

ARTICLE CASSETTE FOR A VENDING MACHINE

Curt A. Bergstén, Bärnstensgatan 14, Helsingborg, Sweden S-253 68

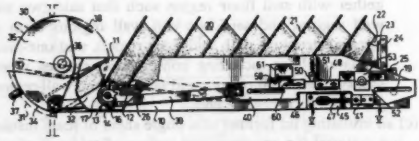
PCT No. PCT/SE87/00555, § 371 Date Jul. 20, 1989, § 102(e) Date Jul. 20, 1989, PCT Pub. No. WO88/04086, PCT Pub. Date Jun. 2, 1988

PCT Filed Nov. 24, 1987, Ser. No. 359,659

Claims priority, application Sweden, Nov. 24, 1986, 86 05013-5

Int. Cl.[5] B65G *59/00*

U.S. Cl. 221—152 10 Claims



1. An article cassette for a vending machine, said cassette being of the kind comprising an elongate approximately horizontal conveyor (13) which is arranged to support a plurality of articles (21) in a row, one after the other, in a storage space (20) located behind a stationary outfeed station (32), and to feed said articles (21) step by step towards said outfeed station (32) while successively transferring the foremost article (21) in said row from the storage space (20) to the outfeed station (32) through a transfer passage between the conveyor and the outfeed station, an access opening defining a front end of the outfeed station,(31) a cover (30) for the access opening mounted for manual rotation around a transverse horizontal axis (36) and movable between, on the one hand a closed position, in which the cover closes said opening, and, on the other hand an open position, in which the cover uncovers the access opening (31) and provides access to the outfeed station (32) enabling an article located in the outfeed station to be removed through said access opening, screen means (38) being provided for keeping the storage space (20) screened off from the outfeed station (32) and preventing access to said spaced from the access opening (31) via the outfeed station (32) when said opening (31) is uncovered, characterized in that said screen means comprise a screen member (38) rigidly connected to the cover (30) and arranged to be inserted into the transfer passage when the cover (30) is rotated in a direction towards its open position and to be withdrawn from the transfer passage when the cover (30) is rotated in the opposite direction.

5,009,329

DISPENSING APPARATUS

Anselmo N. Farrentine, 1368 Pyramid Dr., Las Vegas, Nev. 89108

Filed Oct. 18, 1989, Ser. No. 423,022

Int. Cl.[5] B65G *59/00*

U.S. Cl. 221—175 16 Claims

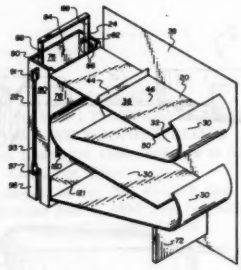
1. An apparatus adapted for dispensing articles, said apparatus comprising:

a storage means for storing articles to be dispensed, said storage means defining an inlet, an outlet and a pathway between said inlet and said outlet;

a channel means mounted on said storage means proximate said outlet and defining a vertically disposed passageway; said channel means being adapted for receiving an article exiting said outlet;

a displacement means mounted within said channel means for elevating said article upward through said passageway;

a retaining means associated with said channel means for engaging said article displaced upwardly through said passageway, said retaining means including a finger member pivotally mounted on said channel means and extending into said passageway, said finger member being adapted to preclude a downward displacement of said article through said passageway after said article has been displaced upwardly past said finger member;



wherein said retaining means is adapted to permit said displacement means to be displaced upwardly and downwardly through said passageway, past said retaining means without obstruction.

5,009,330

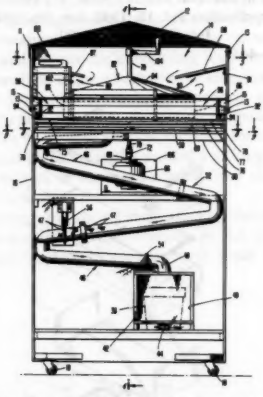
GOLF BALL VENDING MACHINE

Donald R. Young, and Ruth L. Young, both of 12859 Honeybrook Dr., Hudson, Fla. 34669

Filed Jan. 8, 1990, Ser. No. 462,171

Int. Cl.[5] G07F *11/00*

U.S. Cl. 221—196 46 Claims



1. A machine for vending golf balls, comprising:

a hopper for holding a large plurality of golf balls;

an escape aperture formed in a floor of said hopper;

delivery means for sequentially delivering golf balls, one at a time, to said escape aperture;

said delivery means including a rotatable mounted turntable having a plurality of ball-receiving apertures formed therein and rotating means for rotating said turntable, said turntable and said apertures formed therein being specifically positioned within said hopper so that said apertures sequentially pass over said escape aperture as said turntable rotates;

a pipe having an upper end in an open communication with said escape aperture so that a golf ball received within a turntable aperture falls under the influence of gravity into said pipe upper end when said turntable aperture passes over said escape aperture;

a bucket chamber disposed below said hopper;

said pipe having a lower end in open communication with said bucket chamber;

a first gate operative to close said pipe to travel of golf balls therethrough when said gate is closed and operative to open said pipe to travel of said golf balls therethrough when said gate is open;

said first gate positioned near a lower end of said pipe;

a second gate positioned about mid-way between the upper end of the pipe and the lower end of the pipe;

said pipe following a generally spiral downward path of travel; and

control means for selectively opening and closing said first and second gates in a predetermined sequence.

5,009,331

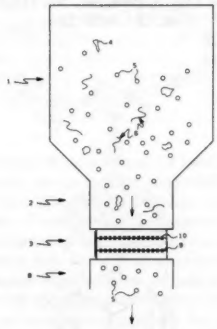
APPARATUS FOR SEPARATING ELONGATED CONTAMINANTS FROM A STREAM OF MATERIAL

Sanford N. Smith, Spartanburg, S.C., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 173,509, Mar. 25, 1988, Pat. No. 4,900,498. This application Oct. 10, 1989, Ser. No. 419,299

Int. Cl.[5] B07B *13/00*

U.S. Cl. 209—615 **17 Claims**



1. An apparatus for separating elongated contaminants from a stream of material containing pellets and said contaminants, said apparatus comprising:

a separation means having wall means defining an entrance, an exit, and an enclosure, said enclosure located between said entrance and exit, each of said entrance and exit having centers defining an axis;

support means comprising rod means within said enclosure;

at least one outwardly extending projection affixed to said rod means to snag said contaminants as said pellets continuously flow in substantially parallel relation to said axis through said enclosure.

5,009,332

OUTPUT HOPPER APPARATUS

Benjamin H. Sannel, St. Louis Park; Steven A. Miller, Mahtomedi, and Robert A. Sells, Minneapolis, all of Minn., assignors to Datacard Corporation, Minnetonka, Minn.

Filed Nov. 23, 1988, Ser. No. 276,236

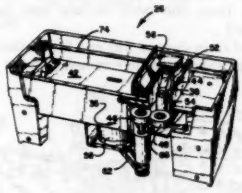
Int. Cl.[5] B07C *9/00*; **B65H** *29/44*

U.S. Cl. 209—652 **18 Claims**

1. An output hopper apparatus for receiving cards passed through card processing stations, the card processing stations having card sensing means determining a status of each card as acceptable or rejected comprising:

(a) card deflecting means in communication with the card sensing means for deflecting the cards toward one of two or more card stacks and driving the cards onto the card stack, wherein the card deflecting means comprises a rotatable deflector arm including a roller at its tip;

(b) card feed means for advancing the cards to the card deflecting means;



(c) card retention means for preventing cards in the card stacks from obstructing a path swept by the card deflecting means, so that the cards are maintained in the card stacks in sequence; and

(d) card stack tensioning means pressing each card against adjacent cards in the card stacks.

5,009,333

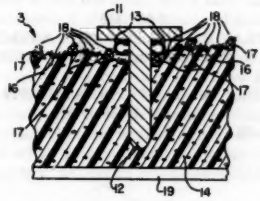
JEWELRY HOLDER KIT

Karen Souders, 449 Colgate Ave., Elyria, Ohio 44035

Continuation-in-part of Ser. No. 255,489, Oct. 8, 1988, Pat. No. 4,907,704. This application Sep. 25, 1989, Ser. No. 411,664

Int. Cl.[5] A47F *7/00*

U.S. Cl. 211—13 **20 Claims**



1. A kit for making a holder for an object such as jewelry or the like which has a pin-like penetrating part and a shorter protrusion on one side, the kit comprising:

a stock pad consisting essentially of resilient foamed polymer, the pad having a self-healing working surface that exposes a multitude of open cells and has an at least partial facing of discontinuous paint on said working surface, said open cells and discontinuous paint being for the purpose of assisting to obliterate puncture marks from service, the pad having sufficient depth for gripping and retaining the penetrating part of the object to be held, the working surface being readily penetrable by the penetrating part and depressible by the shorter protrusion for the purpose of accepting said penetrating part that is to be gripped and retained by the foamed polymer; and

at least one pattern of configuration adapted to the confines of the pad for decorating and/or shaping it.

5,009,334

ANTI-PILFERAGE FIXTURE

Stanley H. Bodkins, Sharon, Mass., assignor to The Gillette Company, Boston, Mass.

Filed Sep. 19, 1989, Ser. No. 409,252

Int. Cl.[5] A47F *7/00*

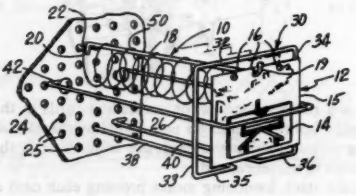
U.S. Cl. 211—54.1 **11 Claims**

1. An anti-pilferage fixture to be employed with at least one rod extending outwardly from a wall surface and terminating in a free end spaced from the wall surface for supporting a

plurality of items disposed in a row on the rod for movement therealong, said fixture comprising:

means disposed along the length of the rod for inhibiting lateral movement of an item supported on the rod including a pair of elongated side members, one disposed on either side of the plurality of items, each said side member extending from the wall surface and being attached thereto; and

means spaced from the rod free end for inhibiting movement of no more than a predetermined number of items outwardly from the rod free end including a front member disposed substantially parallel to the wall surface and connecting the outer ends of said side members, and a substantially rectangular frame attached to said side members, said front member being located a predetermined distance outwardly from the rod free end and said frame being located between the wall surface and the rod free end whereby items are removed from the rod free end within the predetermined distance between the rod free end and said front member.

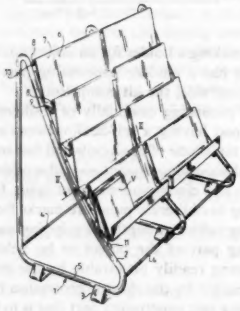


5,009,335

DISPLAY DEVICE FOR FLAT ARTICLES

Robert G. C. Jonker, Toernooiveld 24, 4902 PH Oosterhout, Netherlands

Filed Nov. 1, 1989, Ser. No. 430,019
Int. Cl.[5] B42F 7/00
U.S. Cl. 211—55 **12 Claims**



1. A device for displaying flat articles comprising:

a frame;

at least one substantially horizontal suspension member supported by the frame;

a plurality of carrier elements for holding said flat articles, each carrier element including a body portion comprising a first substantially planar surface having a front edge and a rear edge; lower engagement means comprising a second substantially planar surface extending upwardly from said front edge of said first substantially planar surface; a back portion comprising a third substantially planar surface extending upwardly from said rear edge of said first substantially planar surface, wherein said third substantially planar surface of the back portion extends further upwardly from the body portion than said second planar surface of the lower engagement means; and upper engagement means for overhanging said suspension member or the lower engagement means of another carrier element, said upper engagement means comprising a hook-like suspension strip along an upper edge of the third substantially planar surface of said back portion, wherein said hook-like suspension strip extends backwardly and downwardly from the upper edge of the third substantially planar surface, wherein the upper engagement means of a first carrier element overhangs the substantially horizontal suspension member, and the upper engagement means of a second carrier element overhangs the lower engagement means of said first carrier element; and

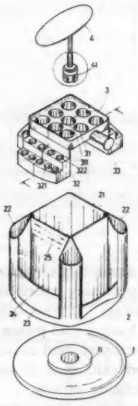
at least one support means for supporting said first and second carrier elements in the vicinity of the rear edge of the body portions thereof, wherein said support means has the form of a strip which is releasably connected to the frame and extends downwardly from adjacent the suspension member.

5,009,336

STRUCTURE OF A MULTIPURPOSE, HAND-HELD SWIVEL TYPE STATIONERY CASE

Peter Liaw, 25 Lane 60, Alley 164 Fu Lin Street, Taipei, Taiwan

Filed May 3, 1990, Ser. No. 518,372
Int. Cl.[5] A47F 7/00
U.S. Cl. 211—69.1 **1 Claim**



1. A multipurpose, hand held rotary type stationery case comprising:

a disk shaped base having a ball bearing mounted in the center of the upper surface thereof;

a casing having a depression in the bottom surface, rotatably mounted on said base with the ball bearing received in the depression, a plurality of vertically disposed upwardly opening hollow cones mutually spaced around the periphery of said casing and a plurality of pockets, one disposed between each pair of cones mounted on said casing in the lower portion thereof, and said casing defining a plurality of horizontally extending grooves between each pair of cones in the upper portion thereof;

a trapezoidal pen rack comprising a recessed top flat board having a plurality of holes therein for holding pens, and a center hold with a plurality of projection strips on the bottom internal surface of said center hold, a plurality of step sideboards extending downwardly and outwardly from said recessed top flat board at all each side except one, said stepped sideboards having a purality of holes on each step, a suspension rod extending outwardly from the

open side of said recessed top flat board, and a plurality of projecting portions on the inner surface of said vertical wall of said step sideboards, each projection portion extending into a groove in said casing for mounting said rack thereon; and

a handle having an expanded bottom end releasably fastened in the center hole of said rack, said expanded bottom end having a plurality of projecting strips thereon for engaging the

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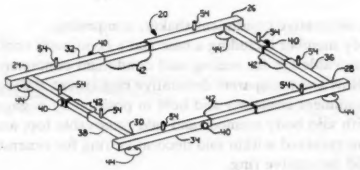
5,009,337

AUTOMOTIVE PARTS SUPPORT RACK

Domenico Bimbi, 2494 Highmoore Rd., Highland Park, Ill. 60035

Filed May 1, 1989, Ser. No. 345,771
Int. Cl.[5] A47F *5/00*
U.S. Cl. 211—86 **8 Claims**



1. An automotive parts support rack for holding objects such as automotive parts, the rack being temporarily located on a substantially horizontal surface of a vehicle, comprising:

a frame having a substantially rectangular configuration with four corners and having first and second longitudinally adjustable side sections connected respectively by first and second longitudinally adjustable end sections, each of said first and second side sections and said first and second end sections having a means for holding the respective side and end sections at a desired length, each of the first and second side sections and each of said first and second end sections being a substantially straight rod having a telescoping portion, said means for holding releasably engaging said telescoping portion to permit said rod to be adjustable;

at least four means for temporarily supporting the frame on the surface of the vehicle attached to an underside of said frame at least substantially in the vicinity of said four corners, that is each of said corners having attached in a vicinity thereof at least one of said means for temporarily supporting the frame on the substantially horizontal surface of the vehicle; and

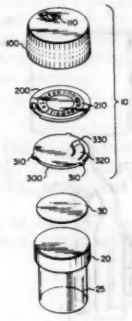
means for supporting the objects having a predetermined rigid configuration, said means for supporting retained on an upper side of said frame, said means for supporting the objects being retained on the upper side of said frame by at least one upward projecting leg on the upper side of said frame which engages a corresponding opening in a bottom area of said means for supporting the objects, at least one of said first and second side sections and said first and second end sections of said rack having said upward projecting leg for engaging said corresponding opening in said bottom of said means for supporting objects, said opening being a slot oriented parallel to the end or side section having the corresponding upward projecting leg, thereby allowing the rectangular size of the frame to be changed without removing the means for supporting the objects.

5,009,338

INDICATOR CAP FOR A MEDICINE BOTTLE

Allan Barker, Boulder, Colo., assignor to Senetics Corporation, Boulder, Colo.

Filed Feb. 3, 1989, Ser. No. 306,485
Int. Cl.[5] B65D *51/24*
U.S. Cl. 215—230 **10 Claims**



1. An indicator cap for attachment to a sealing cap of a container, said sealing cap being a pre-existing container cap that forms a seal on said container, and for indicating the number of times said container has been opened comprising:

(a) an outer cover comprising a top piece, an indicator window located in said top piece, and a skirt attached to an outer circumference of said top piece and extending away from said top piece;

(b) a snap cover lacking means for directing securing said indicator cap to said container and having means for attaching said snap cover to an inner surface of said skirt that allows said skirt to rotate a predetermined number of degrees in each direction without causing rotation of said snap cover while rotation of said skirt beyond said predetermined number of degrees will cause said snap cover to rotate;

(c) an indicator wheel disposed between said snap cover and said top piece having indicating means on a surface facing said indicator window;

(d) rotation means connecting said indicator wheel and said outer cover for causing movement of said indicator wheel only when said outer cover is rotated in a first direction; and

(e) antirotation means connecting said snap cover and said indicator wheel for preventing movement of said indicator wheel when said snap cover is rotated in a second direction opposite said first direction;

(f) means for attaching said snap cover to said sealing cap of said container.

5,009,339

METHOD OF AND AN APPARATUS FOR VENTING A FILLING PLANT

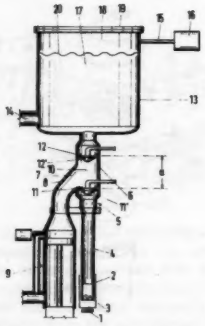
Goran Hanerus, Malmo, and Tommy Ljungstrom, Hoor, both of Sweden, assignors to Tetra Pak Holdings & Finance S.A., Switzerland

Filed Oct. 17, 1989, Ser. No. 422,683
Int. Cl.[5] B67C *3/22*; B65B *31/00*
U.S. Cl. 222—1 **8 Claims**

2. A method of venting a plant for filling containers by means of a dispensing pump with an apportioned quantity of liquid without the inclusion of air, the liquid being supplied via a buffer container through serially connected bottom and upper control valves to a filler pipe connected to the dispensing pump, the bottom control valve disposed at the intake of the filler pipe, the filler pipe being provided at its outlet end

with a filler nozzle, comprising the steps of (1) maintaining the bottom and upper control valves open, (2) creating a vacuum within the buffer container, (3) allow air to bubble out upwardly, (4) close the upper control valve, (5) after a delay, close the bottom control valve, (6) open the upper control valve, (7) after a delay, close the upper control valve.

5. An apparatus for venting a plant for filling containers with an apportioned quantity of liquid without any air inclusion,



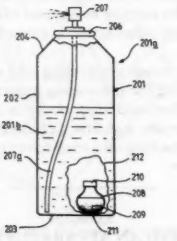
comprising in combination a dispensing pump, a buffer container connected to a feed line and a vacuum pump, a filler pipe adapted to have its outlet closed by a filler nozzle, a control valve housing with an upper externally and separately positively controlled control valve which connects to the buffer container and a bottom externally and separately positively controlled control valve which occludes the intake end of the filler pipe.

5,009,340

PACKAGING CONTAINER USING A SYSTEM OF FERMENTATION TO PRODUCE A PROPULSIVE GAS

Bruno Morane, Neuilly, France, assignor to L'Oreal, Paris, France

Filed Oct. 27, 1988, Ser. No. 263,358
Claims priority, application France, Oct. 30, 1987, 87 15050
Int. Cl.[5] B65D *35/22*
U.S. Cl. 222—94 **3 Claims**



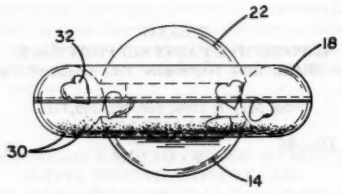
1. A container for packing under pressure a liquid or pasty fluid, provided with a distribution valve, with said fluid to be distributed being placed under pressure by means of propulsive gas composed of carbon gas obtained by anaerobic fermentation of a fermentation system containing sugars, using yeasts, with a components of said fermentations system being selected qualitatively and quantitatively so that the carbon gas produced creates a pressure inside the packing container which is capable of ensuring the distribution of the fluid by said valve, wherein the fermentation system is contained in a chamber provided inside said container, said chamber comprising a small rigid reservoir which is normally closed by a valve, said valve being calibrated to open only when the pressure in said reservoir exceeds by a given value the pressure prevailing in the interior space of the container, said reservoir being ballasted so that the liquid phase of the fermentation system is located vertically beneath said valve, whatever the position of said container.

5,009,341

DECORATIVE CONDIMENT SHAKERS

Peter A. Broxton, Uppingham, England, assignor to Loncraine Broxton & Partners Limited, England

Filed Aug. 28, 1989, Ser. No. 398,900
Int. Cl.[5] A47G *19/24*
U.S. Cl. 222—130 **7 Claims**



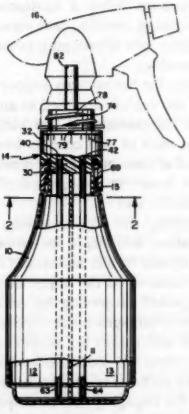
1. A decorative condiment shaker, comprising:
a body member including a base and a condiment container;
a removable top for sealing said condiment container;
a hollow and transparent decorative ring mounted about said condiment container and held in position by engagement with said body member and said removable top; and
means received within said decorative ring for ornamenting said decorative ring.

5,009,342

DUAL LIQUID SPRAYING ASSEMBLY

Ronald L. Lawrence, San Diego, Calif., and Mark R. Miller, 680 Brotherton, Escondido, Calif. 92025, assignors to Mark R. Miller and Steven J. Berling, both of Escondido, Calif.

Filed Aug. 14, 1989, Ser. No. 393,292
Int. Cl.[5] B61D *5/00*
U.S. Cl. 222—136 **19 Claims**



1. A liquid spraying assembly for selectively dispensing at least two different liquids, comprising:
an outer container containing at least two separate compartments for containing two different liquids, the container having an outlet;

a spray pump assembly mounted on the container for dispensing liquids from the compartments; and

a valve assembly connected between the compartments and the spray pump assembly for controlling the dispensing of the two different liquids, the valve assembly comprising an inner valve member having a outlet passageway for connection to the spray pump assembly, a first inlet passageway for connection to one of the liquid compartments, and a second inlet passageway for connection to the other liquid compartment, and an outer control sleeve rotatably mounted on the inner valve member, the outer control sleeve including connecting means for controlling connection of the inlet passageways to the outlet passageway, the outer control sleeve being rotatable between at least two different connects at least one of the respective inlet passageways to the outlet passageway.

5,009,343

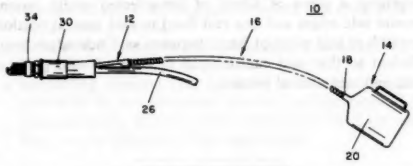
AUTOMOTIVE TOOL

Benjamin E. Pugatch, 68 Pond St., North Easton, Mass. 02356

Filed Feb. 12, 1990, Ser. No. 478,936

Int. Cl.[5] B67D *1/07*

U.S. Cl. 222—192 **1 Claim**



1. The combination of a tool, a spark plug wire and a spark plug, the tool comprising a head portion, a container and a flexible hose connection, the container having a nozzle and a pump to pump fluid contents therefrom, the flexible hose connection connecting the nozzle to the head portion, the head portion having a longitudinally extended, arced blade portion, the spark plug wire having a plug wire terminal positioned within a nipple, the nipple having a rear aperture, the spark plug wire passed through the rear aperture, the spark plug including a top cap, the top cap positioned within the nipple and electrically engaging the plug wire terminal whereby after positioning the blade portion at the rear aperture and within the nipple, action of the pump forces said fluid in the container through flexible hose connection onto the blade portion and onto the connection between the plug wire terminal and the top cap.

5,009,344

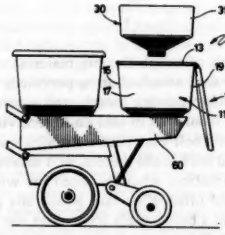
BULK MATERIAL HANDLING APPARATUS

Edwin L. Cooley, 201 Houser St., Monon, Ind. 47959

Filed Oct. 16, 1989, Ser. No. 422,330

Int. Cl.[5] B65D *88/54*

U.S. Cl. 222—325 **5 Claims**



1. A rigid bulk container having a shoulder and a threaded neck at the top thereof, said neck being adapted to receive a cap screwed thereon, and having a mouth at the top of the said neck and a tape seal adapted to close the said mouth and a tether attached at one end to the said seal and attached at the other end to a handle which handle is adapted to be pulled for removal of the said seal from the mouth of the said container, said container having provided in the bottom thereof a handle adapted for grasping by a person and said container having sides that are tapered towards the top and a threaded cap adapted to be screwed onto the neck of the said container and adapted to seal the said container, wherein the said cap is provided with a storage compartment adapted for storage of the said tether and tether handle and an external handle adapted for carrying the container.

5,009,345

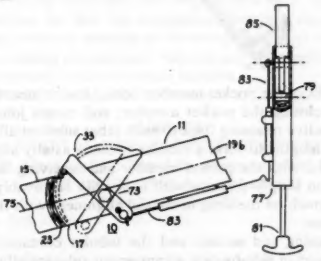
CHUTE CLOSURE APPARATUS

Michael A. McSweeney, Lemont, and John F. Stufflebeam, Romeoville, both of Ill., assignors to J. I. Case Company, Racine, Wis.

Filed Oct. 10, 1989, Ser. No. 419,461

Int. Cl.[5] B65D *47/00*

U.S. Cl. 222—556 **10 Claims**



1. An apparatus for controllably closing a seed-dispensing chute connected to a seed hopper, such chute having a pair of side walls, each such side wall having a longitudinal center line, the apparatus including:

a chute;

a gate assembly movable between an open position and a closed position, such gate assembly thereby controllably opening and closing the chute, such gate assembly including a first arm and a second arm depending from a bridge member, each such arm having two ends including a proximal end and a distal end, such distal ends being connected by a linkage pin, each such arm being mounted on the chute for pivoting movement with respect thereto, such mounting being by a pivot mount attached to each arm at a point between such ends and closer to such distal ends, such pivot mounts defining a pivot axis located near to but non-coincident with the longitudinal center lines of the side walls of the chute, such mounting providing a reduced distance of travel of such linkage pin as the gate assembly is moved between open and closed positions.

5,009,346

SLING MOUNTABLE POUCH FOR FIREARMS

Ronnie T. Butler, Lakeland, Fla., assignor to Peace River Arms & Accessories, Inc., Lakeland, Fla.

Filed Nov. 21, 1988, Ser. No. 273,863

Int. Cl.[5] A45C *13/30*

U.S. Cl. 224—205 **9 Claims**

1. In combination with a firearm carrying sling having a strap portion, a gun cleaning kit mounted on the strap portion, the kit comprising:

at least one firearm cleaning rod section having a length;

a tubular container having a length generally equal to the

length of the cleaning rod section; the container containing a cleaning tool handle and a plurality of other gun care and maintenance accessory elements therein, and further having a replaceable top thereon for providing access to the contents of the container;

a pouch comprising a generally rectangular pocket member having a top with an opening, a closed bottom, and left and right sides having lengths generally equal to the length of the cleaning rod section; opposing left and right elongated retaining flaps respectively joined substantially along the full lengths of the left and right sides of the pocket member and having lengths generally equal to the

lengths of the pocket member sides; closure means releasably closing the pocket member; and means joining the respective retaining flaps to each other substantially along their lengths to form a tubular opening axially aligned in parallel with the pocket member and receiving the strap portion snugly therethrough to readily removably retain the pouch on the sling in coaxial alignment with the strap portion;

the cleaning rod section and the tubular container being received in side-by-side arrangement substantially within the pocket for removal therefrom through the pocket opening.

5,009,347

WRIST HOLSTER

Bill E. Phelps, Box 2595, Jackson, Wyo. 83001

Continuation of Ser. No. 266,396, Nov. 12, 1988, abandoned. This application Jan. 29, 1990, Ser. No. 474,629

Int. Cl.[5] A45C *11/00*

U.S. Cl. 224—219 **4 Claims**

1. In combination, a canister shaped in a cylinder of preselected length containing gas of the type used to repel intruders and assailants, and a holster therefor, said holster comprising a wristband formed of a single piece of fabric having an inner and an outer surface, said wristband comprising a central portion, a first band of substantially lesser width than said central portion extending in a first direction from said central portion and having a first outer terminus, a second band of substantially lesser width than said central portion extending therefrom in a direction opposite said first band and having a second outer terminus, said central portion having top and bottom parallel edges tapering inward to merge with the lesser width of said first and second bands, a buckle on said outer surface, first means fixing said buckle in place vicinal said first outer terminus, second means vicinal said second outer terminus engageable with said buckle to tighten said holster around the wrist of the wearer in a variety of positions, a pouch fixed to said outer surface on said central portion shaped complementary to said cylinder and of a length less than said preselected length to retain a substantial portion but not all of said canister with said canister extending transversely relative to said first and second bands, one end of said pouch being open and an end of said canister extending out of said pouch for easy gripping by the wearer, and third means on said central portion detachably retaining said canister in said pouch, said third means being quickly releasable, said third means comprising a closure strap fixed to a margin of said central portion adjacent said open end of said pouch and extending outwardly therefrom, said closure strap being substantially narrower than said central portion, said closure strap being foldable to extend over the outside of said pouch, said closure strap being capable of being inserted inside said pouch whereby said closure strap may be folded back to close off said open end to retain said canister in said pouch, said pouch having an outer pouch surface, said third means being located on said outer surface of said wristband and one surface of said closure strap, said pouch comprising a piece of fabric of pre-selected width having opposite side edges and one end fixed to said central portion, the width of said piece of fabric between said side edges being sufficient so that said canister can fit between said piece of fabric and said central portion.

5,009,348

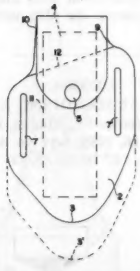
KNIFE SHEATH OF TOUGH FLEXIBLE MATERIAL

Keith Derkatz, P.O. Box 1118, Stn. "A", Kelowna, B.C., Canada V1Y 7P8

Filed Jan. 10, 1990, Ser. No. 462,802

Int. Cl.[5] B26B *29/02*

U.S. Cl. 224—232 **6 Claims**



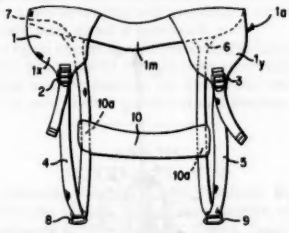
1. A knife sheath of tough flexible material, comprising a back wall, a front wall attached at its periphery to said back wall to form a knife-receiving pouch, and a pair of laterally spaced slits in said front wall of said knife-receiving pouch for receiving a wearer's belt that passes through said pouch between the front and back walls thereof, said slits being offset in the longitudinal direction, whereby when the wearer's belt is passed through said offset slits, said pouch sits at a forward angle on the wearer's belt, snugly located on the wearer's hip and tucked in the belt.

5,009,349

LIFTING AND CARRYING DEVICE

Geir O. Eide, Olav Bismos gate 9, N-2670 Otta, and Dag I. Eide, Maelan 12, N-7460 Roros, both of Norway

Filed Jul. 6, 1989, Ser. No. 376,853
Claims priority, application Norway, Jul. 8, 1988, 883058
Int. Cl.[5] A45F 3/04
U.S. Cl. 224—260 10 Claims



1. Lifting and carrying device (1*a*) adapted for support on a user's body, said device constituting an auxiliary means for the user to lift and carry articles of various size, shape and weight, said device (1*a*) comprising in combination:

an elongated and relatively soft shoulder and neck yoke (1) having end portions,

a tie loop (4, 5) depending from the area of each end portion (1*x*, 1*y*)) of said yoke (1) and,

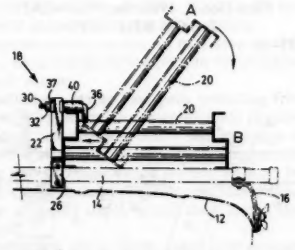
a supporting element (10) adjustably attached to said tie means (4, 5), and extending between said tie loops (4, 5), and selectively movable from a back portion of the user's body to the hip area of the user's body.

5,009,350

RETAINER ASSEMBLIES FOR ELONGATED OBJECTS

John M. Schill, 208 Samuel Street, Kitchener, Ontario, Canada N2H 1R6, and William C. Schill, 18 Windy Ridge, Kitchener, Ontario, Canada N2P 1N3

Filed Sep. 8, 1989, Ser. No. 404,379
Int. Cl.[5] B60R 9/048
U.S. Cl. 224—324 13 Claims



1. A retainer assembly for use in combination with a support member to retain on the support member an elongated object having two transversely spaced longitudinal sides and having a predetermined height when in a horizontal position thereon, the assembly comprising;

a body member having an one end attachment means for its attachment to the support member and adapted when so attached to extend generally vertically therefrom;

a transverse member extending from the body member to be generally parallel to the support member and to be spaced from the support member to provide between them a respective vertically-extending gap of height just greater than said predetermined height of the elongated member, into which gap one side of the elongated object is inserted generally horizontally, said one side being so inserted with the other side elevated above the support member and the other side then being rotated downward onto the support member until the elongated member is in said horizontal position for its retention by the assembly;

means connected between said transverse member and said body member for preventing said transverse member from movement in any direction on said body member and relative to the support member;

the transverse member having a retainer portion extending generally parallel to the body member to provide a respective horizontally-extending gap of smaller height than said vertically-extending gap and adapted to receive said one side of the elongated object when inserted therethrough, the retainer portion being adapted to engage the elongated object in its horizontal position and retaining it against transverse movement out of the vertically-extending gap; and

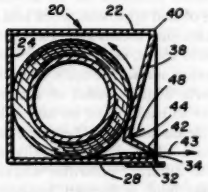
a compressible resilient member on the transverse member between the body member and the retainer portion, the uncompressed resilient member reducing the height of the vertically-extending gap to less than said predetermined height of the elongated object and being adapted to be compressed generally vertically by said one side of the elongated object upon said insertion thereof into the vertically-extending gap and the subsequent downward rotation of the other side into engagement with the support member, so that the compressed resilient member will apply vertical pressure to the elongated object and hold it in retaining engagement with the support member against movement in any direction thereon.

5,009,351

SHEET-MATERIAL DISPENSING BOX

Vivian M. Handler, 1727 David St., Pensacola, Fla. 32514

Filed Aug. 24, 1988, Ser. No. 235,623
Int. Cl.[5] B26F 3/02
U.S. Cl. 225—52 8 Claims



1. A container for holding and dispensing a roll of flexible sheet material, said container comprising:

a. a box for containing said roll, said box comprising bottom, top, rear and end walls, said top wall having a top forward edge and said bottom wall terminating in a lower forward edge;

b. a cutting edge mounted on said lower forward edge, whereby a portion of said sheet material may be severed from the remainder of said sheet material,

c. an abrasive material mounted rearwardly of said cutting edge in the interior of said box and on said bottom wall, whereby said sheet material passes over and in contact with said abrasive material on the way to said cutting edge; and

d. biasing means for resiliently biasing said sheet material into light frictional contact with said abrasive material, whereby a portion of said sheet material may be pulled past said abrasive material in preparation for dispensing a portion of said sheet material, said frictional contact being sufficiently great that the new free end of said sheet material created when a portion of said sheet material is severed by said cutting edge is restrained from re-entering said box, said biasing means comprising a front wall, said front wall comprising:

(1) a first portion sloping downwardly and inwardly from said top forward edge to a horizontal fold line; and

(2) a second portion sloping downwardly and outwardly from said fold line, said second portion terminating in an edge pressing said sheet material into said frictional contact; and

(e) detaining means for retaining said second portion in position, said retaining means comprising a tab extending inwardly from one of said end walls and engaging said front wall.

5,009,352

APPARATUS FOR CONVEYING DIELECTRIC SHEETS

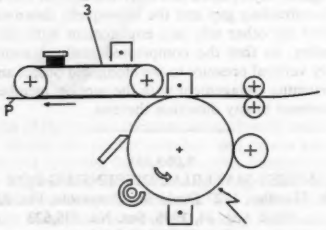
Masashi Yasuda, Kobe; Yoshihiro Uchimoto, Habikino, and Yasunori Mikata, Hyogo, all of Japan, assignors to Bando Chemical Industries, Ltd., Hyogo and Unico Co., Ltd., Osaka, both of, Japan

Filed Jun. 30, 1989, Ser. No. 374,541

Claims priority, application Japan, Jul. 1, 1988, 63-165740

Int. Cl.[5] B65H *20/00;* **G03G** *15/02*

U.S. Cl. 226—94 **7 Claims**



1. An apparatus for conveying dielectric sheets in which said sheets to be conveyed consist of a dielectric material which are held by electrostatic adhesion on an adhesion surface of a conveying means of said apparatus when said adhesion surface is charged by a charging means and conveyed by causing said conveying means to move, said apparatus being characterized in that said adhesion surface consists of a dielectric material and electrode parts which consist of a conductive material provided adjacent to each other on said adhesion surface of said conveying means and said dielectric material and said electrode parts are both electrostatically charged by said charging means to different polarities whereby a strong and stable electrostatic field is created between said dielectric material and said electrode parts of said conveying means for electrostatically adhering said dielectric sheets to said conveying means.

5,009,353

CABLE TENSIONING DEVICE

John W. Alquist, Quinnesec, Mich., assignor to Lake Shore, Inc., Kingsford, Mich.

Filed Feb. 1, 1990, Ser. No. 473,617

Int. Cl.[5] B65H *77/00;* **B66D** *1/00*

U.S. Cl. 226—172 **8 Claims**

1. A cable tensioner comprising,

a base,

a pair of generally horizontal elongated platforms mounted side-by-side on said base,

a drive pulley at one end of each platform,

a driven pulley at the other end of each platform,

a multiplicity of idler pulleys mounted in a line along the edge of each platform adjacent the other platform,

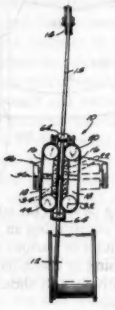
an endless belt having a grooved exterior and gear teeth on its interior and encircling the drive, driven and idler pulleys of each platform whereby the belts on said platforms have a generally horizontal long straight run between them to receive a cable therebetween in the grooved exterior,

a motor connected to each said drive pulley,

a brake connected to each said driven pulley,

a means for adjusting the spacing between said platforms to adjust the force with which said belts grip a cable in said straight run,

means enabling said platforms to tilt as a unit about a generally horizontal axis transverse said elongated platforms,



means enabling said platforms to pivot in a generally horizontal plane as a unit about a generally vertical axis,

means enabling said platforms to rise or fall as a unit relative to said base, and

slide means between said base and said platforms permitting said platforms to move laterally of said platforms in a generally horizontal plane,

said motors and said brakes being energized as required to provide desired tension on the cable leading either direction from the tensioner.

5,009,354

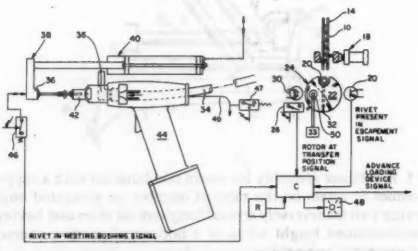
AUTOMATIC RIVETING MACHINE

Anthony D'Aquila, Trumbull; Charles F. Smart, and Raymond H. Varian, both of Danbury, all of Conn., assignors to Emhart Inc., Towson, Md.

Filed Dec. 1, 1989, Ser. No. 445,079

Int. Cl.[5] B21J *15/10*

U.S. Cl. 227—2 **6 Claims**


RIVET PRESENT IN ESCAPEMENT SIGNAL
ROTOR AT TRANSFER POSITION SIGNAL
ADVANCE LOADING DEVICE SIGNAL
RIVET IN NESTING BUSHING SIGNAL

1. A rivet setting machine comprising

a rivet tool for setting rivets,

a loading device for loading individual rivets into said rivet tool, said loading device including rivet receiving means

means for delivering a rivet to said rivet receiving means including

means for presenting a rivet at a transfer position,

means for verifying that a rivet is at said transfer position,

feed tube means,

pressurized air means for transferring a rivet presented at

the transfer position through said feed tube means to said rivet receiving means,

means for actuating said pressurized air means,

means for determining that a rivet has transferred from said transfer position to said rivet receiving means,

means for generating a fault signal in the event said determining means fails to determine that a rivet has transferred from said presenting means to said rivet receiving means to indicate that the rivet is between said receiving means and said transfer position,

means for again operating said pressurized air means in the event said fault signal is generated, and

means for again operating said presenting means in the event a rivet is not received by said rivet receiving means and operating said pressurized air means for the third time when the next rivet is located at said transfer position.

5,009,355

ELECTRIC STAPLER

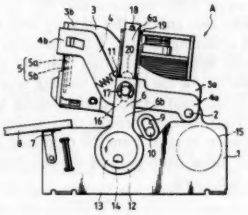
Nobuyuki Akizawa; Yasunori Kudo; Toshiyuki Kanai; Yasuo Kamei; Nobuaki Oyama, and Akihito Negishi, all of Tokyo, Japan, assignors to Max Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 291,221, Dec. 28, 1988, abandoned. This application Apr. 2, 1990, Ser. No. 504,032

Claims priority, application Japan, Dec. 28, 1987, 62-198839[U]; Jan. 26, 1988, 63-8544[U]; Apr. 21, 1988, 63-54047[U]; Apr. 21, 1988, 63-54049[U]

Int. Cl.[5] B27F *7/17*

U.S. Cl. 227—114 **7 Claims**



1. An electric stapler comprising:

a base;

a magazine pivotally mounted on said base for movement in a vertical plane, said magazine including:

a cartridge mounting portion for mounting a staple cartridge having an accommodating portion for containing a stack of staple sheets;

means defining a staple feed path extending from said accommodating portion to a staple supply portion including an endless belt disposed below said cartridge and having an outer friction surface disposed to engage a staple sheet within said accommodating portion so as to feed it from said accommodating portion to said staple supply portion so that a leading staple in said sheet is in a staple supply position;

means defining a staple driver guide path generally perpendicular to said staple feed path means and passing through said staple supply position;

a staple driver for reciprocal movement along said driver guide path means from an initial position to a stapling position so as to drive a staple fed to said staple supply position, through an article to be stapled;

an actuating link having a first end operatively engaged with said magazine and said staple driver for moving said magazine and said staple driver in a vertical plane, and a second end pivotally mounted on said base;

a drive shaft mounted on said base and operable by a motor for rotation about its axis;

a disc-shaped cam member fixedly mounted on said drive shaft in eccentric relation thereto for rotation therewith;

a connecting rod having at one end an annular portion in which said cam member is rotatably fitted so that rotation of said cam moves said connecting rod in a vertical plane, said connecting rod having a central portion which is connected to a vertically central portion of said actuating link whereby said actuating link is pivotally moved when said rod moves vertically; and

clinching means for folding legs of the staple extending through the article against the article.

5,009,356

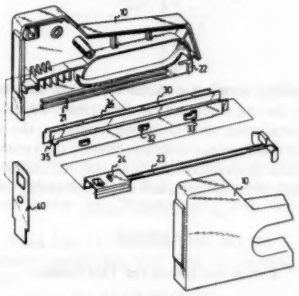
REMOVABLE MAGAZINE FOR STAPLE GUNS

Ted Chang, No. 204-2, Chiung Lin Rd., Hsin Chuang City, Taipei Hsien, Taiwan

Filed Jan. 8, 1990, Ser. No. 461,679

Int. Cl.[5] B27C *5/02;* **B25C** *5/02*

U.S. Cl. 227—120 **3 Claims**



1. A staple gun comprising a housing which is constituted by two side plates, a striker, a striking mechanism including a handle, and a magazine together with a spring-biased staple pusher and characterized in that said magazine is an elongated substantially "U" sectioned member having two limbs each with a plurality of protrusions formed on an outside surface thereof to co-operate with a groove formed on an inside surface of each said side plate, said grooves being so disposed that said magazine is slidable therealong with said protrusions inserted thereinto, each of said side plates further having a retainer disposed at the rear end of said magazine so as to retain said magazine within said housing, said magazine further having a stop formed on the outside surface of each of the limbs thereof to prevent said magazine from being further pushed forwards by abutting the rear ends of said grooves.

5,009,357

JOINING OF CERAMIC COMPONENTS TO METAL COMPONENTS

Derrick J. Baker, Chieveley; Walter G. Bugden, and Peter R. Smith, both of Nottingham, all of England, assignors to Lilliwyte Societe Anonyme, Luxembourg

Filed Jul. 25, 1989, Ser. No. 385,323

Claims priority, application United Kingdom, Jul. 28, 1988, 8818050

Int. Cl.[5] B23K *101/36, 103/16*

U.S. Cl. 228—122 **17 Claims**

1. A method of joining together a ceramic component and a metal component for use in the construction of a high temperature electrochemical cell, which method comprises the steps of:

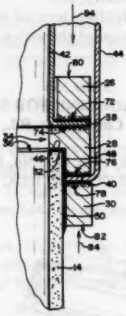
metallizing a surface of the ceramic component with a metallizing metal to form a metallized layer thereon; and

thermocompression bonding the metal component to the metallized layer,

the ceramic component comprising alpha-alumina, the metal of the metallized layer comprising at least one metal selected from the group consisting of tantalum, titanium,

vanadium, tungsten and molybdenum, and the metal component comprising at least one metal selected from the group consisting of iron, nickel, cobalt, chromium, manganese and copper, and

the metallizing of the surface of the ceramic component



comprising forming a metal matrix on said surface, the matrix having a continuous glass phase dispersed therein, the metallizing step including applying the metallizing metal to said surface and then heating the ceramic component to a temperature of above 800° C. under a reducing atmosphere in the presence of glass-forming constituents.

5,009,358

Patent Not Issued For This Number

5,009,359

PROCESS FOR JOINING WORKPIECES OF METAL OR CERAMIC BY BOUNDARY SURFACE DIFFUSION

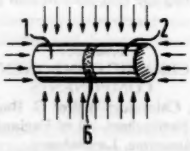
Detlev Stover, Niederzier; Hans-Peter Buchkremer, Heinsberg, and Rudolf Hecker, Jülich, all of Fed. Rep. of Germany, assignors to Forschungszentrum Julich GmbH, Jülich, Fed. Rep. of Germany

Filed May 9, 1990, Ser. No. 521,091

Claims priority, application Fed. Rep. of Germany, May 13, 1989, 3915702

Int. Cl.[5] B23K *20/00, 20/24*

U.S. Cl. 228—175 **1 Claim**



1. A process for joining workpieces, both of metal or of ceramic or one of metal and one of ceramic, to each other by hot isostatic pressing and boundary surface diffusion between the materials of the respective workpieces at this location of joining, in which process junction surfaces of the respective workpieces are put together and fixed in juxtaposition, and are then subjected to hot isostatic pressing, said process comprising the steps of:

completing the fixation of the juction surfaces of the workpieces in juxtaposition to each other by plasma jet coating of the outer edge of the location of joining with a layer compatible with the materials of the workpieces;

after plasma jet coating and before hot isostatic pressing, sintering at low pressure said layer produced by plasma jet coating;

applying mechanically stable pressing force until hot isostatic pressing is performed; and

sealing gas-tight the location of joining and hot pressing isostatically the fixated workpieces while the location of joining is sealed gas-tight.

5,009,360

METAL-TO-METAL BONDING METHOD AND RESULTING STRUCTURE

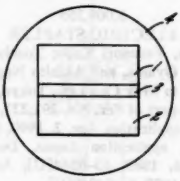
Arnold Reisman, Raleigh, N.C.; Deepak Nayak, Los Angeles, Calif., and Iwona Turlik, Raleigh, N.C., assignors to MCNC, Research Triangle Park, N.C.

Continuation of Ser. No. 277,620, Nov. 29, 1988, abandoned.

This application Feb. 27, 1990, Ser. No. 486,064

Int. Cl.[5] B23K *31/00, 103/14*

U.S. Cl. 228—198 **11 Claims**



1. A method for bonding flat metal surfaces comprising the steps of:

placing said flat metal surfaces in contact with one another; and

forming an oxide bond between said flat metal surfaces in contact with one another by heating said flat metal surfaces in an oxidizing ambient atmosphere to a temperature substantially below the melting point of said flat metal surfaces and below the eutectic melting point of said metal and said oxide, said oxide itself bonding said flat metal surfaces to one another through the formation of chemical bonds between oxygen from the oxidizing ambient atmosphere and metal from each of the flat metal surfaces, as the oxide is formed.

5,009,361

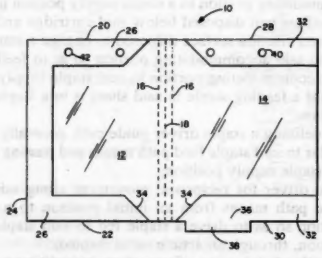
PROTECTIVE COVER FOR A FILE FOLDER

Zhenia J. Chariton, 630 Arlington, Novato, Calif. 94947, and Barbara J. Teixeira, 2618 Las Gallinas Ave., San Rafael, Calif. 94903

Filed Dec. 18, 1989, Ser. No. 451,989

Int. Cl.[5] B65D *27/00*

U.S. Cl. 229—1.5 R **10 Claims**



1. A protective cover for a file folder having left and right panels separated by at least one fold line, each said panel having top and bottom edges and a side edge and one of said panels having a label tab depending from the bottom edge thereof; said protective cover comprising:

a pair of cover panels, each of a size and shape to cover completely one of said file folder right and left panels, said cover panels being separated by at least one score line;

top and bottom flaps on said cover panels to receive said top and bottom edges of said left and right panels;

means forming a slot in the bottom flap of one of said cover panels to receive and interlock with said label tab.

5,009,362

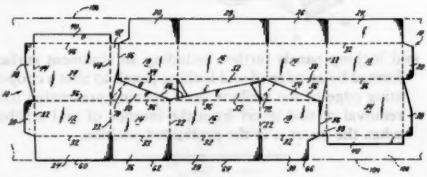
QUICK-ASSEMBLED FOLDING CARTON WITH REINFORCED BOTTOM THAT LOCKS IN POSITION

Edward J. Brangle, Jr., 11885 Lackland Rd., Ste. 26, St. Louis, Mo. 63146

Continuation-in-part of Ser. No. 328,066, Mar. 23, 1989, abandoned. This application Sep. 17, 1990, Ser. No. 583,577

Int. Cl.[5] B65D *5/36*

U.S. Cl. 229—117 **27 Claims**



1. A folding carton formed from a blank sheet of carton material, the carton comprising:

first, second, third and fourth carton wall sections connected together end-to-end along fold lines scored between adjacent wall sections, the wall sections being arranged to be formed into a rectangular configuration;

a carton bottom section bound by four fold lines arranged in a rectangular configuration, the bottom section being connected to the first wall section along the first fold line and the bottom section being enclosed by first, second and third strengthening flanges connected respectively along the second, third and fourth fold lines of the bottom section in their entirety; and

carton bottom locking means formed unitarily with the second, third and fourth carton wall sections and arranged to engage the first, second and third strengthening flanges respectively, to maintain the carton bottom section in a desired position relative to the four carton wall sections when the carton wall sections are formed into a rectangular configuration.

5,009,363

BRIDGE SEPARATED TRAY AND BLANK FOR FORMING IT

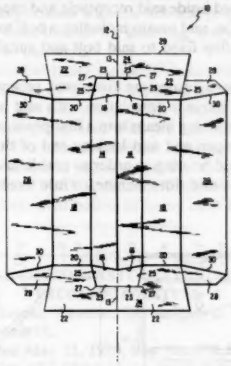
James F. Zavatone, 109 N. Mid America Mall, Apt. 1511, Memphis, Tenn. 38103

Filed Mar. 15, 1990, Ser. No. 493,652

Int. Cl.[5] B65D *5/48*

U.S. Cl. 229—120.17 **11 Claims**

1. A unitary paperboard blank for making a tray having at least a pair of parallel troughs, the blank including a series of elongated, parallel panels each having parallel, elongated edges and joined by fold lines in series to each other along their elongated respective edges, each panel of at least one adjacent pair of said panels being trapezoidal and having shorter edges, termed free edges, not foldably connected to any of said panels, said pair of trapezoidal panels adapted to form an arch partition between an adjacent pair of parallel troughs, said parallel panels including a pair of generally rectangular, trough bottom forming panels each joined to one of said elongated respective edges of a respective said trapezoidal panel, said trough bottom forming panels having an angled tray end forming flap attached along a fold axis to each shorter edge of the former, one leg of each end wall forming flap being oppositely spaced from one of said free edges of a respective said trapezoidal panel, the free edge of each trapezoidal panel slanting away from the fold axis which joins a trough bottom forming panel to the latter's angled flap, the length of the fold line joining said trapezoidal panels being longer than the length of the fold lines



oining any of said trapezoidal panels to its next adjacent said trough bottom forming panel.

5,009,364

EASY-OPEN PACKAGE FOR FLUENT MATERIAL

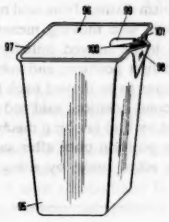
Georg Bolte, Vechelde, Fed. Rep. of Germany, assignor to Schmalbach-Lubeca AG, Braunschweig, Fed. Rep. of Germany

Filed Jan. 11, 1990, Ser. No. 463,371

Claims priority, application Fed. Rep. of Germany, Jan. 19, 1989, 3901517

Int. Cl.[5] B65D *5/70*

U.S. Cl. 229—123.2 **5 Claims**



1. An easy-open package for a fluent material, the package comprising:

an upwardly open base vessel having an annular rim;

a foil having an outer periphery engaging the rim and formed inward of the periphery with an annular tear line defining a tearout portion;

an open tab engaging the portion within the tear line and having one leg lying on the foil and another leg joined at a fold to the one leg and projecting from the foil;

an annular bond securing the foil at the periphery of the foil to the rim;

a bond securing the one leg of the tab to the foil adjacent the tearout portion; and

a bond securing the one leg of the tab to the portion within the tear line.

5,009,365

REMOVABLE COIN STORAGE RECEPTACLE FOR SLOT MACHINES

Dominique Holtzer, 7,rue Moncey, 25000 Besancon, France

Filed Nov. 29, 1988, Ser. No. 277,173

Claims priority, application France, Dec. 8, 1987, 87 17040

Int. Cl.[5] G07B *15/00*

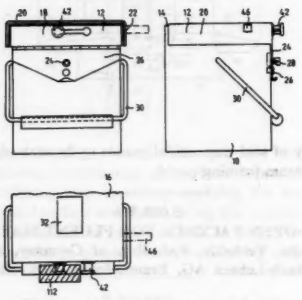
U.S. Cl. 232—16 **6 Claims**

1. A removable coin storage receptacle for slot machines, the receptacle comprising:

a housing provided with a slot in one of its faces for receiving coins;

means mounted inside said receptacle and capable of moving in translation, said means including a bolt having a locking end and a flap fixed to said bolt and suitable for closing said slot;

operating means projecting from said receptacle and constrained to move in translation with said bolt in order to move said moving means into a first position in which said slot is left open and said locking end of the bolt projects out from said housing in order to enable said receptacle to be locked to said slot machine, or into a second position in



which said flap closes said slot and in which said locking end is retracted so as not to project out from said housing; and

a latching mechanism distinct from said operating means and co-operating with said moving means for enabling said moving means to be moved initially from said second position to said first position; and subsequently enabling said moving means to be moved back from said first position to said second position; said moving assembly then being prevented by said latching mechanism from returning to said first position until after said latching mechanism has been acted upon by using controlled access means.

5,009,366

MAILBOX INSERT

Albert van Druff, Jr., Lawrenceville, and David A. Fussell, Lilburn, both of Ga., assignors to Cornerstone Products Inc., Norcross, Ga.

Filed Feb. 16, 1990, Ser. No. 480,951
Int. Cl.[5] V65D *91/00*
U.S. Cl. 232—17 **3 Claims**

1. A tray-type insert for use with a mailbox in delivering and removing mail from the box, said insert being movable between a retracted position within the box and a protracted position partially removed from the box comprising:

a rectangular shaped bottom panel;

side panels generally rectangular in shape and foldably attached to longitudinal edges of said bottom panel; said side panels including locking tab openings at one end thereof;

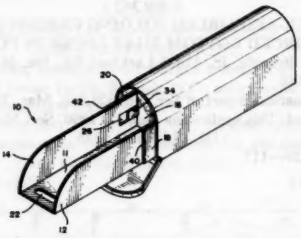
an end panel foldably attached to an end of said bottom panel;

said bottom panel, side panels and end panel forming a mail receiving chamber;

locking panels having hinge means for attachment to said end panel, said locking panels being positioned on said side panels outwardly of said mail receiving chamber;

locking tab detents formed at a juncture of said end panel and each of said side panels;

locking tabs integrally formed on said locking panels an positioned; opposite said side panel openings, said locking tabs being folded through said side panel openings and lockingly positioned in said locking tab detents tab detents securing said side panels to said end panel; and



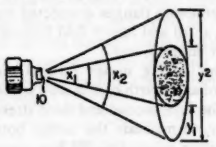
said locking panels further including an abutment surface formed by an edge of said locking panels to abut a cooperating edge of the mailbox door opening preventing total removal of said insert from the interior of said mailbox when the insert is in the protracted position.

5,009,367

METHODS AND APPAPARATUS FOR OBTAINING WIDER SPRAYS WHEN SPRAYING LIQUIDS BY AIRLESS TECHNIQUES

Kenneth A. Nielsen, Charleston, W. Va., assignor to Union Carbide Chemicals and Plastics Technology Corporation, Danbury, Conn.

Filed Mar. 22, 1989, Ser. No. 327,275
Int. Cl.[5] B05D *1/02, 1/04*
U.S. Cl. 239—3 **44 Claims**



1. In a method for the airless spraying of a coating composition which comprises passing the composition under pressure through an orifice to produce a spray pattern having a maximum first width, the said composition comprising (i) a solids fraction containing at least one component capable of forming a coating on a substrate; and (ii) a solvent fraction which is at least partially miscible with the solids fraction, the improvement which comprises forming a liquid mixture in a closed system, which liquid mixture contains the said (i) and (ii), and also contains (iii) at least one supercritical fluid in at least an amount which when added to (i) and (ii) and sprayed is sufficient to produce a spray pattern having a second width which is greater than the first width.

5,009,368

CONSTANT-PRESSURE, VARIABLE-VOLUME IRRIGATION SPRINKLERS

Donald A. Streck, Ojai, and Jerry R. Iggulden, Santa Clarita, both of Calif., assignors to Light Ideas Incorporated, Woodland Hills, Calif.

Filed Jun. 21, 1989, Ser. No. 369,659
Int. Cl.[5] B05B *3/04, 1/08*
U.S. Cl. 239—70 **16 Claims**

1. A control device for controlling the flow of irrigation water between an inlet and an outlet thereof comprising:

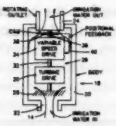
(a) a hollow body having an inlet thereto and an outlet therefrom, said outlet being contained in an outlet member mounted to said body for rotation;

(b) a rotating drive positioned within said body, said rotating drive being a turbine drive including a turbine wheel

positioned within said body to be rotated by a flow of water between said inlet and said outlet; and,

(c) flow control means disposed within said body between said inlet and said outlet and driven by said rotating drive for varying the volume of water discharged through said outlet to areas watered by a sprinkler head connected to said outlet without changing the pressure of said water, said flow control means comprising means for rotating said outlet member at different rates as a function of the radial position of said outlet member.

14. In an irrigation controller which opens a supply valve to input a supply of irrigation water under pressure to at least one sprinkler head for a pre-established irrigation period at pre-set times and days, the improvement to permit high-precipitation irrigation sprinkler heads to achieve average low-precipitation operation over the irrigation period comprising:



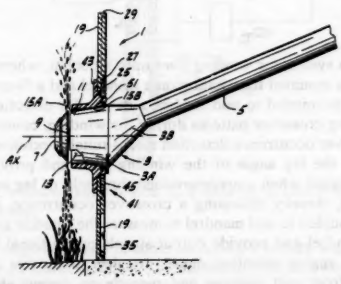
a secondary timer connected in series with the controller to control the opening and closing of the supply valve to, when the irrigation period begins, initially connect the supply of irrigation water to the sprinkler head, allow irrigation water to flow to and through the sprinkler head for a period of time less than that required to produce run-off of the water from an area being watered by the sprinkler head, break the connection between the supply of irrigation water and the sprinkler head, delay for a period of time sufficient to allow previously broadcast water time to soak into the area being watered by the sprinkler head, and repeating a cycle of connecting and breaking the connection between the supply of irrigation water and the sprinkler head until the irrigation period is completed.

5,009,369

SPRAY SHIELD UNIT

Carlos Iwaszkowiec, St. Peters, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Feb. 16, 1990, Ser. No. 481,099
Int. Cl.[5] B05B *15/04, 1/28*
U.S. Cl. 239—223 **14 Claims**



1. A spray shield unit adapted to be mounted on the head of a sprayer, said head having a spinner thereon rotatable about an axis for spraying liquid generally radially outwardly with respect to said axis, said spray shield unit comprising:

a hub having an opening therein for receiving the head of the sprayer, said hub opening having a central axis; and

a generally planer circular shield member mounted on the hub generally coaxial with the hub and projecting radially outwardly from the hub for shielding spray emitted by the spinner from the wind;

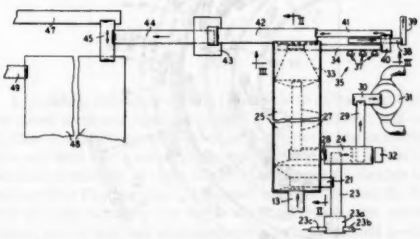
said shield member being rotatable on the hub generally on the central axis of the hub opening whereby when the spray shield unit is mounted on the head of the sprayer and when the sprayer is held with the spinner axis generally horizontal, the shield member may be rolled on the ground to maintain the head of the sprayer in the hub opening a fixed vertical distance from the ground to provide a uniform distribution of spray onto the ground.

5,009,370

MUNICIPAL SOLID WASTE MATERIAL SORTING TROMMEL SYSTEM

Harold B. Mackenzie, Wheaton, Ill., assignor to New Life Foundation, Wheaton, Ill.

Filed May 11, 1989, Ser. No. 350,339
Int. Cl.[5] B02C *23/14;* **B07B** *9/00*
U.S. Cl. 241—24 **18 Claims**



1. A municipal solid waste material sorting system comprising:

a multi-stage trommel having an intake at one end and being downwardly tilted toward an opposite discharge end;

said trommel having a first stage relatively short length upper end section with relatively small size holes, followed by a second stage substantially longer intermediate section provided with substantially larger size holes and then a third stage lowest end relatively short section with largest size holes;

means for delivering heterogenous solid municipal waste into said intake end;

means for receiving for transporting to a selected site waste materials which drop through said small size holes of said first stage

means for further classifying at said selected site said materials which drop through said small size holes of said first stage section;

a further size screening device;

means for directing to said further size screening device materials which drop through said larger size holes of said second stage section;

means for classifying of materials screened by said further size screening device;

sorting conveyor means for receiving materials which drop through said largest size holes of said third stage section;

a manual sorting station through which said sorting conveyor means travels;

take-away means for receiving objects manually sorted from said sorting conveyor means;

means for transporting to a shredder unsorted material received from said sorting conveyor means; and

said transporting means for transporting to said shredder also being arranged for receiving and transporting to said shredder largest size materials not passing through said

largest size holes and discharged from said trommel discharge end.

5,009,371

ROTARY DISINTEGRATING DEVICE

Klaus-Dietrich Nickel, Frankfurt am Main, Fed. Rep. of Germany, assignor to Citadel Investments Limited, St. Helier Jersey, Channel Islands

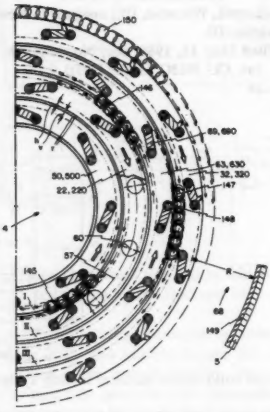
PCT No. PCT/DE89/00040, § 371 Date Sep. 27, 1989, § 102(e) Date Sep. 27, 1989, PCT Pub. No. WO89/07012, PCT Pub. Date Aug. 10, 1989

PCT Filed Jan. 25, 1989, Ser. No. 423,439

Claims priority, application Fed. Rep. of Germany, Jan. 27, 1988, 3802260

Int. Cl.[5] B02C *13/20*

U.S. Cl. 241—187 **41 Claims**



1. A rotary disintegration apparatus comprising a housing with a central material input and a material outlet open underneath, an inner rotor fixed to a fist shaft and an outer rotor fixed to a second shaft on the same axis that rotates in the opposite direction, and blade rings that follow each other in alternation, said blade rings having blades which are inclined relative to the direction of rotation, the blades having front and rear edges of hard wear-resistant material, and which sit on one side on retaining rings and on the other side on assembly rings forming replaceable components of annular assembly ring carriers that are connected to the shafts, si blades being so arranged at a distance from the edges of the assembly and retaining rings of their blade rings that the front edges of the blades of a blade ring and the rear edges of the blades of the following blade ring which rotates in the opposite direction define annular chambers within a disintegration chamber, within which, within a nominal speed range of the rotors, vortex zones of the gas-solids mixture are formed.

5,009,372

ROLL CASSETTE WITH SPACERS FOR HEIGHT ADJUSTMENT

Erhard Loewe, Waldesch, Fed. Rep. of Germany, assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

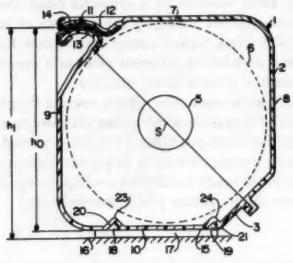
Filed May 1, 1989, Ser. No. 347,388

Claims priority, application Fed. Rep. of Germany, May 11, 1988, 8806260[U]

Int. Cl.[5] B65H *75/00*

U.S. Cl. 242—71.1 **15 Claims**

1. A light-tight cassette for a roll of web material and adapted for use in at least two exposure devices having cassette support surfaces at different heights from points for receiving the material from the cassette comprising a housing defining an outlet slit oriented parallel to a rotational axis of the roll and positioned above a bottom surface of the cassette housing, characterized in that the bottom surface has means for detachably mounting to at least one spacer such that when no spacer



is mounted to the bottom surface the cassette is adapted for use in one of the exposure devices and when one of the spacers is mounted to the bottom surface the cassette is adapted for use in a different one of the exposure devices.

5,009,373

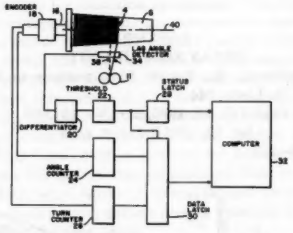
DEVICE AND METHOD FOR DETECTING AND DISPLAYING CROSSOVER PATTERN IN PRECISION WINDING

Troy I. Hester, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 16, 1990, Ser. No. 509,112

Int. Cl.[5] B65H *54/28, 54/00*

U.S. Cl. 242—158 R **6 Claims**



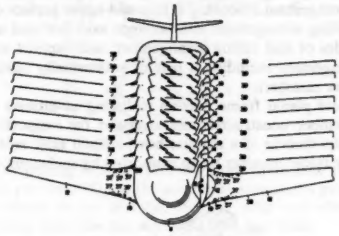
1. In a system for winding fiber onto a bobbin, wherein the bobbin is mounted for rotation on a mandrel and a fiber, to be wound, is coupled to said bobbin, a device for detecting and displaying crossover patterns during the winding, comprising: a crossover occurrence detection means suitably positioned to monitor the lag angle of the winding fiber and provide an output signal when a predetermined threshold of lag angle is detected, thereby indicating a crossover occurrence, an encoder coupled to said mandrel to measure the rotation angle of said mandrel and provide output signals proportional to the rotation angles, counting means coupled to receive output signals from said encoder and provide an output absolute mandrel angle and output number of complete revolutions of the mandrel at any time, and displaying means suitably positioned to receive output from said detection means and counting means and display the output.

5,009,374

AIRCRAFT WITH RELEASABLE WINGS

Carl Manfredi, 5 Virginia Rd., Bellerose Village, N.Y. 11001; Antonina Manfredi, 45-38 48 St., Woodside, Queens, N.Y.; Dario P. Manfredi, 16 Stubbe Dr., Stony Point, N.Y. 10980, and Savia Giarraffa, 70 Sanford Dr., Randolph, N.J. 07869

Filed Apr. 26, 1988, Ser. No. 186,151
Int. Cl.[5] B64C 1/32
U.S. Cl. 244—1 R 9 Claims



1. An aircraft comprising

a fuselage having a frame and an outer skin;

a pair of wings extending from said fuselage, each said wing having a beam extending from said frame and an outer skin disposed in overlapping relation with said fuselage skin;

a plurality of explodable bolts securing each beam to said fuselage frame;

a plurality of circumferential rows of rivets securing each wing skin to said fuselage skin;

a pair of burnable tapes, each said burnable tape being secured to an inner circumferential periphery of a respective wing skin between two of said rows of rivets and adjacent said fuselage; and

means for exploding said bolts and igniting said tapes simultaneously to disconnect said wings from said fuselage.

5,009,375

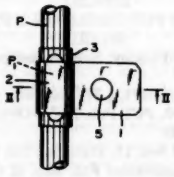
Patent Not Issued For This Number

5,009,376

SEIZURE-FIXING DEVICE OF PIPE BY CLAMP MEMBER

Masayoshi Usui, Numazu, Japan, assignor to Usui Kokusai Sangyo Kaisha Ltd., Japan

Filed Apr. 24, 1990, Ser. No. 513,871
Claims priority, application Japan, Apr. 26, 1989, 1-48981[U]; Apr. 26, 1989, 1-48982[U]; Apr. 26, 1989, 1-48984[U]
Int. Cl.[5] F16L 3/08
U.S. Cl. 248—74.1 14 Claims



1. A seizure-fixing device of a pipe by a clamp member, comprising:

a pipe;

an elongated clamp member including a seizure wall wrapping around the pipe and a mounting wall leastwise at one longitudinal end of the clamp member;

a resinous bush having a thermal contractility, the bush being interposed between the pipe and the clamp member and bonded via a bonding layer to an outer peripheral surface of the pipe; and

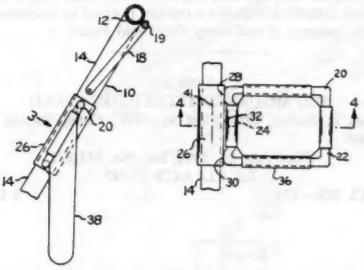
a fixing means for resiliently fixing the seizure wall of the clamp member to the bush, the fixing means comprising a fitting wall so formed on the pipe as to assume a non-circular shape in section, the non-circular shape including at least one flat outer peripheral surface on the pipe, and a seizure wall formed in a shape similar to the sectional shape of the fitting wall.

5,009,377

DEBRIS COLLECTION FOR A LAWNMOWER

Joseph N. Mangeruga, 168 South Odessa Ave., Egg Harbor, N.J. 08215

Filed Feb. 6, 1990, Ser. No. 475,879
Int. Cl.[5] B65B 67/04
U.S. Cl. 248—99 1 Claim



1. A debris collection device attachable to an inclined circular cross-sectioned handle element of a lawnmower: said collection device comprising an endless annular frame consisting of a rod bent into a rectangular configuration to form four rod sections connected at right angles to each other; a flexible bag having four flap portions (36) looped over and around the four rod sections whereby the bag is suspended from the annular frame; one of said rod sections having an intermediate portion thereof offset from the corners at the ends of said one rod section; a resilient clip means attached to said annular frame for partial encirclement around an inclined handle element of a lawnmower; said resilient clip means comprising a single circularly curved metal sheet extending along said one rod section in the plane of the annular frame; said curved metal sheet being welded to the corners at the ends of said one rod section whereby a slot (32) is formed between said curved metal sheet and the intermediate portion of said one rod section; one of said flap portions extending over the intermediate portion of said one rod section and through said slot; and an elastomeric lining on the interior surface of the resilient curved metal sheet, whereby said elastomeric lining is enabled to frictionally grip the circular cross-sectioned surface of an inclined handle element of a lawnmower.

5,009,378

RAKE MATE AND METHODS OF CONSTRUCTING AND UTILIZING SAME

John C. Linsmeyer, and Greg Linsmeyer, both of P.O. Box 195, Quinnesec, Mich. 49876

Filed Jan. 4, 1990, Ser. No. 460,731
Int. Cl.[5] B65B 67/04
U.S. Cl. 248—99 12 Claims

1. An apparatus for removably securing a bag mouth in an open position, comprising:

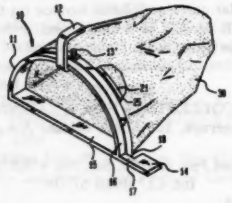
a frame member including a base adapted to support said apparatus, said frame having a rolled rim which secures a strap to said frame and cooperates with said strap to secure a bag to said apparatus;

a semi-circular portion of said frame contiguous with said base;

a handle attached to said semi-circular portion;

bag attachment means comprising a strap extending along a rear portion of the bottom of said base upwardly such that the ends of said strap meet adjacent said handle; and

a foot pad extension extending from said base outward from said semi-circular portion, said boot pad accommodating a user's foot securely hold said apparatus while inserting



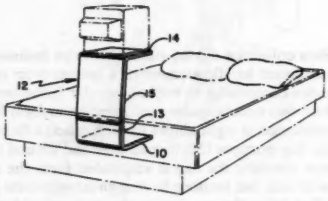
material through said apparatus into said bag, said foot pad extension includes a cut-out portion to accommodate the passage of said strap about said frame.

5,009,379

BED MOUNTED TELEVISION STAND

Thomas E. Sadler, 1250 First St., NW., Cedar Rapids, Iowa 52405

Filed Jun. 21, 1990, Ser. No. 541,371
Int. Cl.[5] A47B *23/00*
U.S. Cl. 248—174 **6 Claims**



1. A stand for supporting a television receiver or the like on a bed having a mattress separable from and supported on a suitable support means forming part of the bed, said stand comprising a lower horizontally extending base having an inner end and an outer end, the outer end of the base being insertable between the mattress and its support means so as to position the base therebetween, an upright member extending upwardly from the inner end of the base, and an upper ledge for supporting a television receiver and having an inner end jointed to the upper end of the upright member, the upper ledge being of a sufficient width to accommodate a television receiver and extending substantially horizontally outwardly toward an outer edge spaced from the inner edge a sufficient distance for the ledge to support a television receiver, the upright member being at an acute angle from the vertical toward the outer edge of the ledge so as to create a force that biases the lower base downwardly toward the support means of the bed when a television receiver is supported on the upper ledge.

5,009,380

RAIL MOUNTED RACK FOR BOWL-SHAPED OR KETTLE-SHAPED CONTAINERS SUCH AS OUTDOOR GRILLS AND THE LIKE

Thomas G. Fee, 984 Stratford Rd., Mendota Heights, Minn. 55118

Continuation of Ser. No. 305,108, Feb. 2, 1989, abandoned. This application Jun. 5, 1990, Ser. No. 534,298
Int. Cl.[5] A47B *96/00*
U.S. Cl. 248—214 **20 Claims**

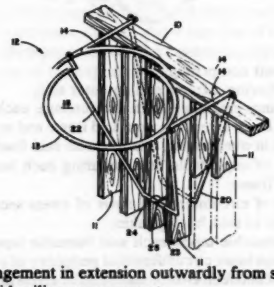
1. A combination comprising:

(a) a railing arrangement having an upper surface and first and second opposite sides; and, said railing arrangement including a horizontal railing supported by a plurality of spaced support members having first and second, opposite, sides corresponding to said first and second sides of sail railing arrangement; and,

(b) a rack for a bowl-shaped grill; said rack being mounted on said railing arrangement; said rack including: a generally planar frame portion; a depending bracing member; and, means for securing said bracing member to said support members of said railing arrangement;

(i) said planar frame portion including a support arm arrangement extending across said upper surface of said railing arrangement and between said first and second sides of said railing arrangement; said support arm arrangement including a pair of substantially horizontal arm members;

(ii) said planar frame portion including an arcuate frame member constructed and arranged for supportive receipt therein of a circular bowl-shaped grill; said arcuate frame member being supported by said support arm



arrangement in extension outwardly from said first side of said railing arrangement;

(iii) said depending bracing member comprising a substantially U-shaped member depending downwardly from said pair of substantially horizontal arm members along said second side of said railing arrangement;

(iv) said means for securing said bracing member to said railing arrangement including: a cross-brace member and an anchoring extension; said cross-brace member being positioned on said first side of said railing arrangement; and, said anchoring extension extending between at least two of said support members, of said railing arrangement, and in securing relation between said cross-brace member and a portion of said depending bracing member; at least one of said support members of said railing arrangement being securely clamped between said depending bracing member and said cross-brace member.

5,009,381

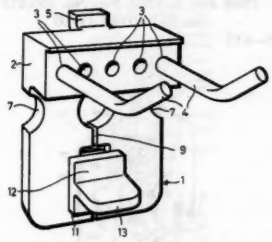
TOOL HOLDER FOR TOOLS ON A PERFORATED BOARD

Fredrik Hermanson, Flugeby, Sweden, assignor to Bengt Henningson, Sweden

PCT No. PCT/SE88/00471, § 371 Date Mar. 13, 1990, § 102(e) Date Mar. 13, 1990, PCT Pub. No. WO89/02347, PCT Pub. Date Mar. 23, 1989
PCT Filed Sep. 13, 1988, Ser. No. 469,526
Claims priority, application Fed. Rep. of Germany, Sep. 14, 1987, 8712428; Mar. 14, 1988, 8803408
Int. Cl.[5] A47B *96/06*
U.S. Cl. 248—221.1 **12 Claims**

1. A holder, for supporting a tool on a perforated board, with a bifurcated generally plate-like base (1) for receiving a tool carrier (4), the bifurcation commencing approximately at the center of said base and extending toward a bottom edge thereof, said base having a front surface and a rear surface with the rear surface of said base being provided with claw means (15) for cooperation with a hole of the perforated board, char-

acterized in that the bifurcation is achieved by a slot (9) which extends through a cut-out portion (10), into which is inserted a twistable locking member (11) having said claw means (15),



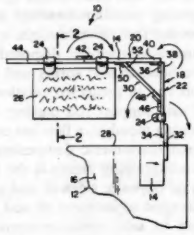
and the locking member (11) is guided in at least one of the cut-out portion (10) and the slot (9) by means of a guiding part (14), shaped to be movable therein, with said claw means projecting from the rear surface of the said base.

5,009,382

INSTRUCTION CLIP FOR SEWING MACHINE

Almyria Huffaker, 2548 McHenry Rd., Goshen, Ohio 45122, and George Spector, 233 Broadway, #3815, New York, N.Y. 10007

Filed Dec. 8, 1989, Ser. No. 447,837
Int. Cl.[5] A47B *97/00*
U.S. Cl. 248—284 **1 Claim**



1. An instruction holder for a sewing machine cabinet which comprises:

(a) a mounting block affixed to rear surface of the sewing machine cabinet;

(b) an inverted L-shaped stanchion having a horizontal arm and a vertical arm having center lines defining a vertical plane said vertical arm is affixed to said mounting block;

(c) at least one clip for suspending an instruction sheet from a pattern envelope on said horizontal arm which extends over top surface of the sewing machine cabinet, so that hands of a person are free while sewing;

(d) an angular brace support extending between said horizontal arm and said vertical arm to keep said horizontal arm in a secured position over the top surface of the sewing machine cabinet;

(e) a first hinge disposed between bottom end of said vertical arm and said mounting block, having means for pivoting said vertical arm rearward aligned with said vertical plane;

(f) a second hinge disposes between top end of said vertical arm and an end of said horizontal arm; adapted to pivot inwardly along said vertical plane

(g) a third hinge disposed on an upper surface between two segmented portions of said horizontal arm;

(h) a fourth hinge disposed between lower end of said angular brace support and said vertical arm; between the first and second said hinges;

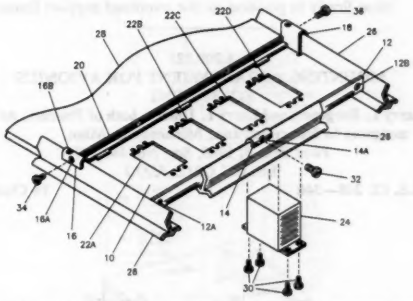
(i) a stop member disposed on the underside of said angular brace support between the second and third said hinges so that said inverted L-shaped stanchion can be collapsed and folded upon itself in a stored position behind the rear surface of the sewing machine cabinet.

5,009,383

SUSPENDED CEILING ELECTRICAL BRACKET

James A. Chapman, Wakefield, Mass., assignor to Daniel J. Chapman, Salem, N.H.

Filed Apr. 30, 1990, Ser. No. 516,966
Int. Cl.[5] F16M *13/00*
U.S. Cl. 248—343 **6 Claims**



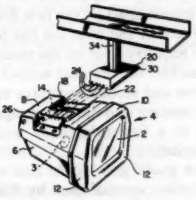
1. A bracket structure for mounting electrical junction boxes in a grid type suspended ceiling, comprising: ceiling tiles supported by spaced and adjoining, inverted, t-shaped grid elements; a sheet of rigid material which replaces a portion of said ceiling tile, so as to overlap the inside edges of said grid elements; said sheet of rigid material of sufficient size to allow one or more cutouts, with said cutouts of sufficient size to allow the insertion of said junction boxes, and with means adapted for securing said junction boxes to said sheet of rigid material; a plurality of support members formed out of or attached to said sheet of rigid material with means adapted for rigidly securing said support members to said grid elements; whereby said bracket structure can rigidly support said junction boxes in said suspended ceiling.

5,009,384

OVERHEAD SUPPORT SYSTEM FOR TV MONITORS

David B. Gerke, and Michael MacDonald, both of Calgary, Canada, assignors to Inter-Link Communciations Inc., Calgary, Canada

Filed Jun. 29, 1990, Ser. No. 545,602
Int. Cl.[5] B42F *13/00*
U.S. Cl. 248—343 **11 Claims**



1. An overhead support system for TV monitors for use on buses and the like comprising:

(a) a shoe carrying cable means for the TV monitor, the cable means electrically associated with an electrical contact means exposed on an outer surface of the shoe, the shoe having sides provided with guide and support means positioned to mateably slide in cooperating guide and

support means in the upper part of a TV monitor housing, into seated position with the shoe electrical contact means electrically engaging corresponding electrical contact means on the TV monitor housing;

(b) support means in the form of a pipe secured at one end to and upwardly extending from the shoe, the shoe cable means extending through the pipe, the pipe to extend through an aperture in an overhead support frame;

(c) shock absorbing means to be supported on the overhead support frame and having an aperture through which the pipe is to extend; and

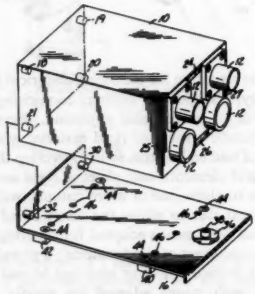
(d) anchor means to sit on the shock absorbing means and releasably engage the other end of the pipe to hold the shoe firmly in position on the overhead support frame.

5,009,385

MOUNTING ARRANGEMENT FOR AVIONICS EQUIPMENT

Larry L. Burgener, and Larry L. Durbin, both of Phoenix, Ariz., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 5, 1989, Ser. No. 446,107
Int. Cl.[5] G01D *11/30*
U.S. Cl. 248—346 **14 Claims**



13. Equipment mounting apparatus comprising:

a housing for holding the equipment;

first and second apertures on the housing spaced a first distance apart;

a first elongated slot on the housing remote from the first and second apertures;

a third aperture on the housing spaced a second distance from the second aperture;

a second elongated slot on the housing remote from the second and third apertures;

first and second mounting members each having a first flat portion with first and second ends, the first end being at substantially right angles to the flat portion;

first and second guide pins on the first end of the first mounting member spaced apart by the first distance and extending from the second end over the flat portion;

a first rotatable eccentric cam on the second end of the first mounting member, the first and second guide pins fitting within the first and second apertures of the housing and the first cam rotating into the first elongated slot to wedge the housing in a first orientation with respect to the mounting member;

third and fourth guide pins on the first end of the second mounting member spaced apart by the second distance and extending over the flat portion; and

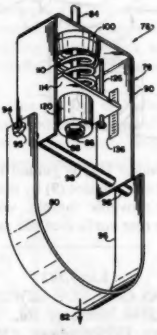
a second rotatable eccentric cam on the second end of the second mounting member, the third and fourth guide pins fitting within the second and third apertures of the housing and the second cam rotating into the second elongated slot to wedge the housing in a second orientation with respect to the mounting member.

5,009,386

PIPE HANGER AND SUPPORT

Richard C. Berger, Off Split Rock Rd., Syosset, N.Y. 11791, and Paul L. Berger, 28 Moss La., Jericho, N.Y. 11753

Filed Jun. 1, 1989, Ser. No. 360,072
Int. Cl.[5] F16M *13/00*
U.S. Cl. 248—613 **3 Claims**



1. A hanger for horizontally supporting a pipe at spaced locations therealong comprising at said locations an inverted U-shaped frame connected to support the pipe at the lower end thereof, a vertically oriented support rod disposed centrally of said frame, a helical spring disposed about said support rod within said frame, the first end of said spring resting in an elastomeric dampening member mounted to said frame and passing said mounting rod therethrough, a horizontally oriented spring-compressing member disposed in said frame in supporting relation beneath said spring and with a depending end of said support rod in projected relation therebelow, the depending end of said support rod passing through a second elastomeric dampening member, a first nut engaging said plate through said second elastomeric dampening member, a first removable spring-compressing means in the form of cooperating nuts and bolts on opposite sides of said spring operatively arranged upon threaded adjustment of said nuts to cause ascending movement in said spring-compressing member to correspondingly cause a prestressing of said spring, and a second spring compressing means formed by said first nut being in threaded engagement on said support rod depending end so as to cause additional ascending movement in said spring-compressing member without movement of said frame to additionally prestress said spring, whereby the partaking of said spring-compressing member of said ascending movements is not accompanied by any vertical movements of said supported pipe.

5,009,387

OBJECT RETAINER FOR UPRIGHT CONCRETE CONSTRUCTION FORMS

Samuel C. Scott, 2519 Walnut St., Denver, Colo. 80209, and William C. Scott, III, 4575 Joliet St., Denver, Colo. 80239

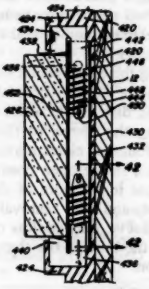
Filed Feb. 6, 1989, Ser. No. 306,168
Int. Cl.[5] E04G *9/10*
U.S. Cl. 249—96 **15 Claims**

1. A retainer device for holding an object in a substantially upright concrete form while concrete is poured into and sets within the form, a surface of the retained object is intended to be exposed in an outer surface of the finished concrete structure, said retainer device comprising in combination:

a flexible liner having a recess sized to closely fit an object to be exposed in the outer surface of the finished concrete structure, said recess having a ridge formed around its perimeter to surround the edges of the object; and

a retainer means attached to said flexible liner through said

liner recess ridge to hold said object within the liner recess so that it will be properly positioned and not dislodged



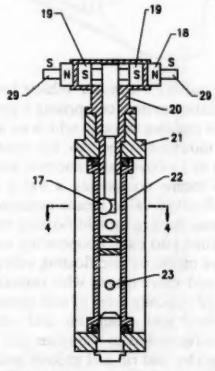
when the concrete is poured into the form, said retainer means being arranged to release from said object when the form is removed from the finished concrete structure.

5,009,388

MAGNETIC-CONTROLLED VALVE FOR FLUID PIPELINES

Mao Pei-gi, Porder Metallurgy Factory Nan-Ning; Gan Jing, Block 28, Room 207, Nan-Ning, Jiang Nan Road, both of Guangxi Zhuang Autonomous Region, China, and Que Binghuang, 2/f, Flat A, Kum On BLdg., No. 3, Station Lane, Hung Hom, Kowloon, Hong Kong

Filed Nov. 7, 1989, Ser. No. 432,482
Claims priority, application China, Jan. 6, 1989, 89 103861
Int. Cl.[5] F16K *31/08, 5/00*
U.S. Cl. 251—65 **3 Claims**



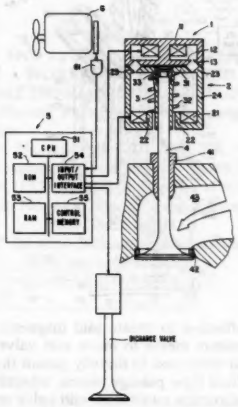
1. A magnet-controlled valve for fluid pipelines comprising: a sealed disk-like guide bushing accommodating an external magnet ring rotatable along the outer wall surface thereof and an internal magnet ring rotatable therein, said internal magnet ring being connected with a connecting rod provided with a stopper element rotatable therewith, and a valve body accommodating a hollow valve plate provided with pressure relief aperture, back pressure aperture and a through hole, said valve plate provided with a peripheral groove for accommodating an expandable packing ring, said connecting rod being inserted into the interior cavity of said valve plate and arranged with its stopper element to be in registry with and engaged with said pressure relief aperture and said back pressure aperture on the two side walls of said valve plate, said through hole provided on the peripheral wall of the valve plate establishing fluid communication between a back pressure area in the interior cavity of said valve plate and the peripheral groove, an expandable packing ring being provided therein.

5,009,389

ELECTROMAGNETIC FORCE VALVE DRIVING APPARATUS

Hideo Kawamura, Samukawa, Japan, assignor to Isuzu Ceramics Research Institute, Co., Ltd., Fujisawa, Japan

Filed Feb. 15, 1990, Ser. No. 480,578
Claims priority, application Japan, Feb. 20, 1989, 1-038429
Int. Cl.[5] F16K *31/06*
U.S. Cl. 251—129.1 **5 Claims**



1. An electromagnetic force valve driving apparatus for opening and closing a suction/exhaust valve of an engine, comprising:

a freely reciprocatable movable magnetic pole member connected to the suction/exhaust valve;

a upper fixed magnetic pole opposing he one end of said movable magnetic pole member;

a first electromagnet comprising a yoke member magnetically communicating with said upper fixed magnetic pole and having a lower magnetic pole opposing the other end of said movable magnetic pole member;

a second electromagnet having a first magnetic pole opposing said upper fixed magnetic pole and a second magnetic pole opposing the one end of said movable magnetic pole member;

a spring for subjecting said movable magnetic pole member to a force which moves said movable magnetic pole member in the direction of the one end thereof; and

energizing control means for energizing said first and second electromagnets when the suction/exhaust valve is released and immediately before it is seated, thereby causing a repulsive force to act between the one end of said movable magnetic pole member and said second magnetic pole.

5,009,390

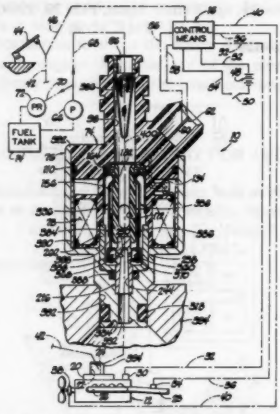
ELECTROMAGNET AND REED-TYPE VALVE ASSEMBLY

Lawrence McAuliffe, Jr., Ann Arbor, and Sidney D. Hardy, Sterling Heights, both of Mich., assignors to Coltec Industries Inc., New York, N.Y.

Filed Mar. 1, 1990, Ser. No. 486,991
Int. Cl.[5] F16K *31/06*
U.S. Cl. 251—129.2 **28 Claims**

1. A valving assembly for variably restricting fluid flow, comprising housing means, electrical field coil means for creat-

ing a magnetic field flux, wherein said field coil means comprises a cross-sectional longitudinal axis, pole piece means, a valve seat, fluid flow passage means formed through said valve seat, a movable valve, armature means, and resilient means normally operatively resiliently urging said valve toward operative seating engagement with said valve seat as to thereby terminate flow of said fluid through said fluid flow passage means, wherein said electrical field coil means upon being



energized is effective to create said magnetic field flux and cause said armature means to move said valve in a direction away from said valve seat to thereby permit flow of said fluid through said fluid flow passage means, wherein as said valve moves in said direction away from said valve seat said valve is moving in a direction generally transverse to said cross-sectional longitudinal axis, and wherein said movable valve also serves as an armature member in addition to said armature means.

5,009,391

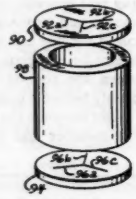
VALVE ASSEMBLY

Carl J. Steigerwald, Fox Lake, Ill., assignor to The Kendall Company, Mansfield, Mass.

Continuation of Ser. No. 453,522, Dec. 20, 1989, abandoned, which is a division of Ser. No. 189,097, May 2, 1988, Pat. No. 4,895,346. This application Oct. 31, 1990, Ser. No. 611,804

Int. Cl.[5] F16L *37/28*

U.S. Cl. 251—149.1 **24 Claims**



1. A valve assembly for receiving an elongated element such as a catheter, comprising:

a hollow body member having a cavity;

a compression member received on one end of the body member and having an annular flange aligned with the cavity;

an elastic duckbill valve having a slit adjacent the distal end of the cavity;

an elastic disc received in the cavity and having a central opening intermediate the valve and the annular flange;

a cylindrical elastic sleeve received in the cavity and having a bore circumferentially surrounded by inner and outer surfaces of the sleeve, the sleeve thickness dimension between the inner and outer surfaces of the sleeve being less than the length dimension of the sleeve;

said slit, opening and sleeve bore being adapted to receive said elongated element and to seal against the outer surface of said element; and

means for adjusting the compression member relative to the body member into a plurality of axially spaced apart positions for exerting different axial forces on the sleeve for inwardly bulging the sleeve, so that the sleeve permits passage of the elongated element axially through the bore of the sleeve in a sleeve open position, immobilizes and holds the element in the bore of the sleeve in a sleeve gripping position, and after removal of the element from the bore of the sleeve, inhibits flow of fluid, such as air or blood, through the bore of the sleeve in a sleeve bulged inwardly position.

5,009,392

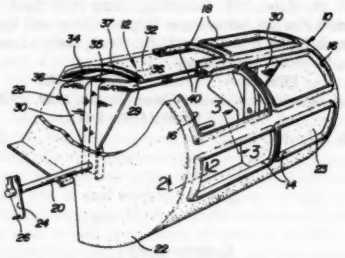
ROTARY AIR VALVE

James C. Ostrand, Armada, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed May 11, 1990, Ser. No. 521,874

Int. Cl.[5] F16K *5/04*

U.S. Cl. 251—180 **4 Claims**



1. A rotary air valve for a motor vehicle heating, air conditioning and ventilation system comprising a generally cylindrical case having an opening through which air may flow, rotary air valve means mounted in the case for rotatable movement about an axis so as to cover and uncover said opening, said rotary air valve means comprising a valve frame rotatable about said axis, floating valve means mounted on said valve frame, spring means for urging said floating valve means radially outward against said case, cooperating annularly extending rib and groove means on said floating valve means and said case for sealing said valve means with respect to said case at one of two pairs of opposite sides of said openings, and axially extending compliant seal means on said case for sealingly contacting said valve means at the other pair of said sides of said opening whereby said rib and groove means and said seal means cooperatively seal said valve means about the perimeter of said opening when said valve means is rotated to cover same.

5,009,393

LINEAR FLOW TURN DOWN VALVE

Dale A. Massey, Orland Park, Ill., assignor to Harper-Wyman Company, Lisle, Ill.

Filed Jun. 13, 1990, Ser. No. 537,367

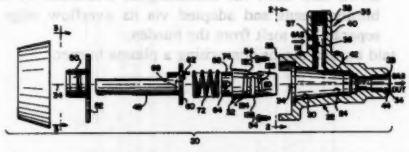
Int. Cl.[5] F16K *5/10*

U.S. Cl. 251—207 **22 Claims**

1. A linear flow control valve for gaseous fuel, comprising:

a valve body having a chamber for receiving a valve plug and including an inlet on one side and an outlet at one end; and

a tubular valve plug rotatably mounted in said chamber about a central axis aligned with said outlet, said plug having an outlet at one end adjacent said chamber outlet and an annular side wall defining a central bore extending longitudinally between opposite ends along said axis of rotation, said side wall closing said chamber inlet when said plug is in an off position in said body and having an inlet port movable into alignment with said chamber inlet providing direct communication between said chamber inlet and said bore when said plug is rotated to a maximum flow, on, position in said body;



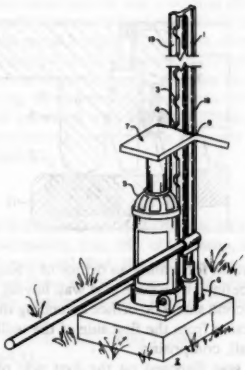
said side wall further including a pair of spaced apart divergent/convergent flow slots, extending generally transversely of said axis and penetrating from an outside surface of said plug to said central bore spaced from said inlet port, said divergent/convergent flow slots providing an effective flow cross-section formed by areas of overlap between said chamber inlet and both of said flow slots as said plug is rotated through an intermediate range of angularly spaced, variable flow positions for continuously changing the gas flow rate through said plug.

5,009,394

METAL FENCE POST EXTRACTOR

Rick A. Marshall, 14902 - 168th NE., Woodinville, Wash. 98072

Filed Apr. 16, 1990, Ser. No. 509,881
Int. Cl.[5] B66F *3/00*
U.S. Cl. 254—30 **20 Claims**



1. An extractor device for dislodging from the ground metal fence posts of the type having a substantially T-shaped cross section and longitudinally spaced lugs, comprising:

a unitary metal plate having a length greater than width so as to define a longitudinal axis and being bent at an obtuse angle about a lateral bend line generally mid-length so as to divide the plate into a post gripping portion and a jacking portion;

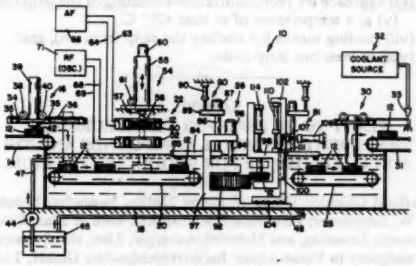
a T-shaped aperture is formed in said post gripping portion substantially normal to the plane of the plate with the stem of the T aperture generally aligned with the longitudinal axis of the plate and terminating adjacent one longitudinal end of said plate, and the cross of the T aperture disposed crosswise of the plate adjacent said jacking portion and proximate said bend line so as to present an edge of said cross engageable with a post lug, said plate portions including said T-shaped aperture being sized so that in one orientation of the plate relative to the post, said T-shaped aperture slips along the length of the post, clearing post lugs, and in another orientation the edges of the T-shaped aperture and adjacent margins o the plate engage the post and one lug to grip the post and to exert a jacking force applied between ground and the jacking portion of the plate on the lug side of the post to extract the post.

5,009,395

METHOD AND APPARATUS FOR SELECTIVELY HEATING A WORKPIECE SUBJECTED TO LOW TEMPERATURE THERMOMECHANICAL PROCESSING

George D. Pfaffmann, Farmington, Mich., assignor to Tocco, Inc., Boaz, Ala.

Division of Ser. No. 6,142, Jan. 23, 1987, Pat. No. 4,744,836, which is a continuation-in-part of Ser. No. 899,323, Aug. 28, 1986, Pat. No. 4,715,707, which is a division of Ser. No. 752,550, Jul. 8, 1985, Pat. No. 4,637,844. This application Mar. 9, 1988, Ser. No. 166,103
The portion of the term of this patent subsequent to Jan. 20, 2004, has been disclaimed.
Int. Cl.[5] C21D *9/68, 11/00*
U.S. Cl. 266—92 **10 Claims**



1. An improved system for isoforming an iron carbide workpiece comprising:

(a) preheating means for heating a first band portion of said workpiece adjacent to the contour of said workpieces to a temperature approximately equal to the M_s temperature of said workpiece while the remaining core portion of said workpiece remains below said M_s temperatures;

(b) final heating means for heating a second band portion of said workpiece encompassing the contour of said workpiece to a temperature at least equal to the austenitic temperature of said workpiece, said second portion smaller than and contained within said first portion of said workpiece;

(c) die forming means for forming the second heated portion of said workpiece to a finished shape while said second portion of said workpiece is in a plastic state at a temperature not less than said M_s temperature and supported by said first portion while the remaining core portion of said workpiece remains below said M_s temperature;

(d) means for controlling movement of said workpiece into said die forming means to insure that said second portion achieves a critical cooling rate and the temperature thereof becomes less than said austenitic temperature; and

(e) means for cooling said workpiece below said M_s temperature after it has been shaped.

5,009,396

METHOD AND APPARATUS FOR THE MANUFACTURE OF FORMABLE STEEL STRIP

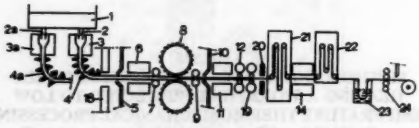
Hulbert den Hartog, Noordwijkerhout, and Erik B. van Perlstein, Beverwijk, both of Netherlands, assignors to Hoogovens Groep B.V., Ijmuiden, Netherlands

Division of Ser. No. 235,152, Aug. 23, 1988. This application Sep. 28, 1989, Ser. No. 414,024

Claims priority, application Netherlands, Sep. 1, 1987, 8702050

Int. Cl.[5] C21D 1/64

U.S. Cl. 266—115 3 Claims



1. Apparatus for the manufacture of formable steel strip having a thickness between 0.5 and 1.5 mm , having the following items arranged in sequence:

(i) at least one continuous casting machine for forming liquid steel into slabs having a thickness of 30 to 100 mm,

(ii) a homogenizing furnace for the slab from (i),

(iii) a planetary mill followed by a planishing mill stand for hot rolling of the slab from (ii) into strip,

(iv) means for cooling the strip from (iii) to a temperature in the range 300° to 850° C. and homogenizing the strip at that temperature,

(v) at least one four-high mill stand for rolling the strip from (iv),

(vi) a furnace for recrystallization-annealing of the strip from (v) at a temperature of at least 620° C.,

(vii) cooling means for cooling the strip from (vi), and

(viii) at least one strip coiler.

5,009,397

PLANT TO BE USED FOR METALLURGICAL TREATMENTS OF METAL COMPOUNDS AND/OR METAL ALLOYS OR FOR PRODUCING CALCIUM CARBIDE

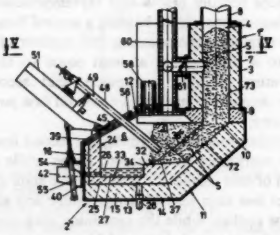
Gerhard Glöckler, Ohlsdorf; Heinz Müller, Neuhofen; Leopold W. Kepplinger; Panajiotis Matzawrakos, both of Linz; Erwin Koch, Leonding, and Heinrich Auberger, Linz, all of Austria, assignors to Voest-Alpine Industrieanlagenbau GmbH, Linz, Austria

Filed Mar. 30, 1990, Ser. No. 502,336

Claims priority, application Australia, Apr. 13, 1989, A877/89

Int. Cl.[5] C21B 7/08

U.S. Cl. 266—197 7 Claims



1. In a plant comprising a furnace for producing a product melt from a metallurgical burden in which the furnace has a laterally disposed melt collecting chamber at one end and an upwardly disposed burden-receiving shaft comprising an upper portion and a lower portion at the other end of said furnace, and at least one burner means entering said furnace above said melt chamber directed towards burden flowing downwardly of said shaft through the lower portion thereof into said furnace, the improvement which comprises:

a combustion chamber disposed above said melt chamber which communicates said melt chamber with the lower portion of said shaft, and

a shelf disposed below the lower portion of said shaft serving as the bottom of said combustion chamber, said shelf extending to and above said melt chamber and terminating into an overflow edge over which melt produced from said burden enters said melt chamber,

said shelf also providing support for said burden flowing down said shaft for metallurgical treatment by said burner means and adapted via its overflow edge to separate the melt from the burden,

said burden means comprising a plasma burner.

5,009,398

DEVICE FOR REDUCING THE STRESSES ON A SEALING SHUTTER

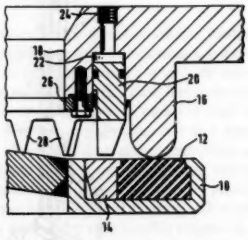
Emile Lonardi, Bascharage, Luxembourg, assignor to Paul Wurth S.A., Luxembourg, Luxembourg

Filed Dec. 8, 1989, Ser. No. 448,002

Claims priority, application Luxembourg, Dec. 30, 1988, 87420

Int. Cl.[5] C21B 7/00

U.S. Cl. 266—199 9 Claims



1. An apparatus for sealing an orifice of a blast furnace, said orifice being defined by a wall, said wall having a first side and an opposed second side, said orifice extending through the wall in a first direction from the first side of the wall to the second side of the wall, comprising:

an annular seat disposed on the first side of the wall and surrounding the orifice;

a shutter for sealing the orifice, comprising:

a shutter body having opposed first and second sides,

a gasket secured to the second side of the shutter body,

said shutter being movable between a closed position, wherein the gasket is disposed in contact with the annular seat to seal the orifice, and an open position, where in the gasket is set apart from the annular seat; and

pressure compensating means for reducing stresses on the gasket while the shutter is maintained in the closed position by urging the shutter in a second direction when the shutter is in the closed position, said second direction being opposite the first direction.

5,009,399

DEVICE FOR TRANSFER OF MOLTEN METAL

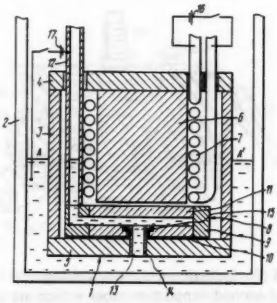
David G. Bykhovsky, ulitsa Esenina, 32, korpus 2, kv. 95, and Alexandr N. Panov, naberezhnaya reki Fontanki, 26, kv. 3, both of Leningrad, U.S.S.R.

PCT No. PCT/SU88/00215, § 371 Date Jun. 1, 1990, § 102(e) Date Jun. 1, 1990, PCT Pub. No. WO90/04878, PCT Pub. Date May 3, 1990

PCT Filed Oct. 28, 1988, Ser. No. 499,331

Int. Cl.[5] H02K *44/02*

U.S. Cl. 266—237 5 Claims



1. A device for transfer of molten metal wherein a centrifugal conduction MHD pump (1) comprises a metal housing (3) provided with a cover (4) and incorporating a working chamber (8) which has a pipe (12) for discharge of molten metal and communicates with a molten metal bath (2), and a magnetic circuit producing a magnetic field within the molten metal contained in the working chamber (8), and wherein the inside surface of the cover (4) of the metal housing (3) is connected to one end of a metal rod (6) which is enclosed on its side surface by a solenoid (7), while the working chamber (8) aligned axially with respect to the metal rod (6) is arranged between the other end of the metal rod (6) and a bottom (5) of the metal housing (3) in such a way as to be dielectrically insulated from them, so that the metal housing (3) with its cover (4) and the bottom (5), the metal rod (6), the solenoid (7) and the working chamber (8) form a magnetic circuit, whereas the bottom (5) of the metal housing (3) and the bottom portion of the working chamber (8) are provided with openings forming a duct (13) hermetically connecting the working chamber (8) with the molten metal bath (2).

5,009,400

ACTIVE SPRING-AND-DAMPER SYSTEM

Gerhard Ott, Herrenberg, Fed. Rep. of Germany, assignor to Dr. Ing. h.c.F. Porsche AG, Fed. Rep. of Germany

Filed Nov. 30, 1989, Ser. No. 443,316

Claims priority, application Fed. Rep. of Germany, Dec. 16, 1988, 3842338

Int. Cl.[5] B60G *17/00*

U.S. Cl. 267—64.11 9 Claims

1. An active spring-and-damper system for placement between a vehicle body and a wheel suspension member, the system comprising:

a piston cylinder unit which has a pressure chamber for static load support and two additional pressure chambers for dynamic load control;

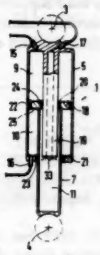
all the three pressure chambers are arranged in a cylindrical housing and are equipped with connections for hydraulic lines;

a first and a second pressure chamber of the three pressure chambers are located in a cylindrical housing on opposite sides of a piston;

the piston is connected with a hollow piston rod defining the third pressure chamber of the three pressure chambers;

all the pressure chambers are sealed off with respect to one another by means of at least three sealing devices;

a guide rod is coaxially arranged within and connected with the cylindrical housing;



the guide rod extends into the third pressure chamber which is located inside the hollow piston rod; and

the hollow piston rod is sealed by one of the three sealing devices to a housing floor of the cylindrical housing.

5,009,401

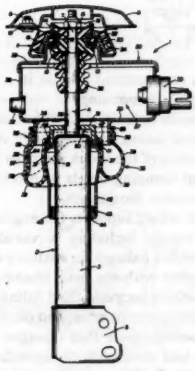
AIR SPRING SUSPENSION SYSTEM WITH DUAL PATH ISOLATION

David A. Weitzenhof, Akron, Ohio, assignor to Bridgestone/-Firestone, Inc., Akron, Ohio

Continuation-in-part of Ser. No. 885,124, Jul. 14, 1986, Pat. No. 4,712,776. This application Dec. 4, 1987, Ser. No. 128,958

Int. Cl.[5] F16F *3/08*

U.S. Cl. 267—64.21 20 Claims



1. An improved suspension system for vehicles including:

(a) a fluid shock absorber strut having a cylinder and a reciprocal piston rod;

(b) a first elastomeric member telescopically mounted on an upper end of the piston rod in a sealing relationship therewith to provide damping when the strut becomes active;

(c) a fluid pressure chamber comprising a rigid annular member sealingly engaged with an outer surface of the first elastomeric member, and a flexible sleeve sealingly connected to and extending between said rigid member and the cylinder for containing a supply of pressurized fluid with said piston rod extending through the pressure chamber;

(d) bracket means for securing an upper end of the fluid pressure chamber to a vehicle support structure;

(e) bearing means located generally radially outwardly from the rigid annular member of the fluid pressure chamber

and located between the bracket means and said rigid annular member for providing movement between the bracket means and fluid pressure chamber; and

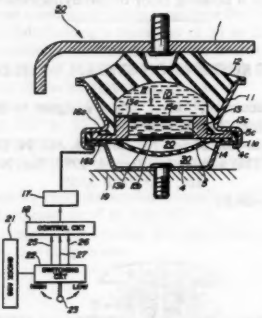
(f) a second elastomeric member located between and secured to the bracket means and to the bearing means to provide the primary load support for the vehicle when in a static state, said second elastomeric member being less elastic deformable than the first elastomeric member.

5,009,402

VEHICLE ENGINE AND SUSPENSION VIBRATION CONTROL ARRANGEMENT

Shigeki Sato, Yokosuka, Japan, assignor to Nissan Motor Co., Ltd., Japan

Filed Jun. 19, 1989, Ser. No. 367,682
Claims priority, application Japan, Jun. 21, 1988, 63-152655
Int. Cl.[5] F16F *5/00*
U.S. Cl. 267—140.1 **5 Claims**



1. A suspension arrangement for use in a vehicle having a chassis and an engine, comprising:

a vehicle suspension comprising a shock absorber including damping control means for selectively varying the damping characteristics of the shock absorber between a plurality of different damping levels to produce a plurality of different suspension hardnesses;

an engine mount which supports the engine on said chassis, said engine mount including a variable-volume main chamber, an orifice passage, an auxiliary chamber which is fluidly connected with the main chamber by said orifice passage, an electrorheopetic fluid filling said main chamber and said auxiliary chamber, and electrodes disposed in said orifice passage such that changes in a voltage impressed upon said electrodes changes the viscosity of the electrorheopetic fluid and the damping characteristics of the mount;

a source of voltage electrically connected with said electrodes for selectively applying one of a plurality of different voltages to said electrodes;

a manually operable switch having a plurality of settings and operatively connected with said damping control means of said shock absorber for switching the damping characteristics of said shock absorber; and

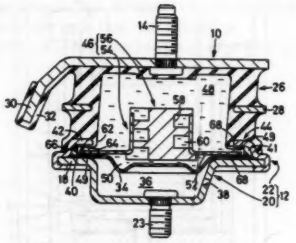
a controller responsive to said switch for controlling the voltage applied to said electrodes by said source of voltage so that when said switch is set to a setting which induces said shock absorber to produce a given damping level, a voltage is applied to said electrodes by said source of voltage such that the damping characteristics of the engine mount are induced to match those produced by the shock absorber for the instant switch setting.

5,009,403

FLUID-FILLED ELASTIC MOUNT

Rentaro Kato, Kasugai, and Tatsuya Suzuki, Inuyama, both of Japan, assignors to Tokai Rubber Industries, Ltd., Aichi, Japan

Filed Jun. 26, 1989, Ser. No. 371,089
Claims priority, application Japan, Jul. 2, 1988, 63-88082
The portion of the term of this patent subsequent to Apr. 23, 2008, has been disclaimed.
Int. Cl.[5] F16M *5/00*
U.S. Cl. 267—140.1 **16 Claims**



1. A fluid-filled elastic mount comprising:

a first and second support member which are spaced apart from each other in a load-receiving direction in which a vibrational load is applied to the elastic mount;

an elastic body for elastically connecting said first and support members;

means for defining a pressure-receiving chamber between said first and second support members, said pressurereceiving chamber being filled with a non-compressible fluid and receiving said vibrational load applied to the elastic mount;

means for defining an equilibrium chamber between said first and second support members, said equilibrium chamber being filled with said non-compressible fluid, at least partially defined by a flexible diaphragm, and having a variable volume;

means for defining a restricted passage for fluid communication between said pressure-receiving chamber and said equilibrium chamber;

a movable member disposed between said pressurereceiving chamber and said equilibrium chamber such that said movable member is movable by a predetermined distance in said loadreceiving direction so as to absorb a fluid-pressure difference between the pressure-receiving chamber and the equilibrium chamber, said movable member being formed of a rigid material and supporting said means for defining said restricted passage;

holding means fixedly supported by said second support member, for holding an outer peripheral portion of said movable member such that the movements of said movable member in said load-receiving direction are limited by butting contacts of said outer peripheral portion of the movable member with a pair of contact surfaces of said holding means; and

a pair of cushioning members secured to said pair of contact surfaces of said holding means, respectively, said outer peripheral portion of said movable member being subjected to shockabsorbing butting contacts with said pair of contact surfaces of said holding means via said pair of cushioning members,

wherein said movable member comprises a first generally cylindrical member having said outer peripheral portion, while said means for defining said restricted passage comprises a second generally cylindrical member having a helical groove formed in an outer circumferential surface thereof, said second cylindrical member being fitted in said first cylindrical member so that said restricted passage

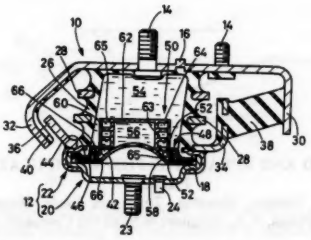
is provided by said helical groove closed by an inner circumferential surface of said first cylindrical member.

5,009,404

FLUID-FILLED ELASTIC MOUNT

Nobuhiro Hirazawa, Inuyama, Japan, assignor to Tokai Rubber Industries, Ltd., Aichi, Japan

Filed Jun. 26, 1989, Ser. No. 371,090
Claims priority, application Japan, Jul. 2, 1988, 63-88081[U]
Int. Cl.[5] F16M *5/00*
U.S. Cl. 267—140.1 **9 Claims**



1. A fluid-filled elastic mount comprising:

a first and second support member which are spaced apart from each other in a load-receiving direction in which a vibrational load is applied to the elastic mount;

an elastic body for elastically connecting said first and second support members;

means for defining a pressure-receiving chamber between said first and second support members, said pressure-receiving chamber being filled with a non-compressible fluid and receiving said vibrational load applied to the elastic mount;

means for defining an equilibrium chamber between said first and second support members, said equilibrium chamber being filled with said non-compressible fluid, at least partially defined by a flexible diaphragm, and having a variable volume;

means for defining a restricted passage for fluid communication between said pressure-receiving chamber and said equilibrium chamber;

a movable member disposed between said pressure-receiving chamber and said equilibrium chamber such that said movable member is movable by a predetermined distance in said load-receiving direction so as to absorb a fluid-pressure difference between the pressure-receiving chamber and the equilibrium chamber, said movable member being formed of a rigid material and supporting said means for defining said restricted passage;

holding means fixedly supported by said second support member for holding an outer peripheral portion of said movable member such that the movements of said movable member in said load-receiving direction are limited by butting contacts of said outer peripheral portion of said movable member with said holding means; and

cushioning means disposed between holding means and said outer peripheral portion of said movable member, said outer peripheral portion being subjected to the contacts with said holding means via said cushioning members,

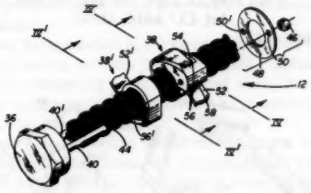
wherein said movable member comprises a first generally cylindrical member having said outer peripheral portion, while said means for defining said restricted passage comprises a second generally cylindrical member having a helical groove formed in an outer circumferential surface thereof, said second cylindrical member being fitted in said first cylindrical member so that said restricted passage is provided by said helical groove closed by an inner circumferential surface of said first cylindrical member.

5,009,405

STRAP WRENCH END ATTACHMENT ASSEMBLY FOR A TWISTED ROPE TORSION BAR

Jack E. Smith, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 19, 1989, Ser. No. 423,930
Int. Cl.[5] B60G *11/18*
U.S. Cl. 267—273 **2 Claims**



1. A strap wrench end attachment assembly in combination with a twisted rope torsion bar, comprising:

an anchor nut connecting to a mounting means for a sprung mass;

means for attaching said anchor nut to said twisted rope torsion bar, including a plurality of tie rods;

a plurality of strap wrenches operated by said tie rods;

said strap wrenches gripping said twisted rope torsion bar, and being adapted to compress said twisted rope torsion bar when torque is applied;

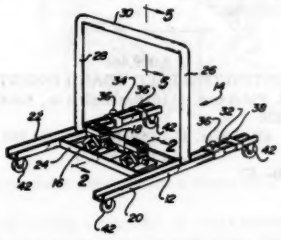
whereby secure and firm compressive engagement is continuously maintained between said end attachment and said twisted rope torsion bar to transmit torque for shock absorption and reduce the stress concentration at the attachment interface.

5,009,406

VEHICLE DOOR REMOVAL APPARATUS

Gregory J. McDermott, 4725 Clippert, Dearborn Heights, Mich. 48125

Filed Jan. 5, 1990, Ser. No. 461,319
Int. Cl.[5] B23Q *3/00*
U.S. Cl. 269—17 **15 Claims**



1. A vehicle door removal and replacement apparatus for allowing removal of a door by a single individual operator comprising:

a base portion, said base portion comprising a pair of channel members connected by a central cross member;

an adjustable support connected to said base portion, said adjustable support for engaging a lower edge of an opened vehicle door for vertically supporting the door;

a vertically extending frame member extending from said base portion, said frame member comprising means to adjust said frame member along said base portion for accommodating different widths of vehicle doors; and

a means to secure the vehicle door to said frame member, such that the means to secure and the adjustable support hold the door in a fixed position whereby the door may be

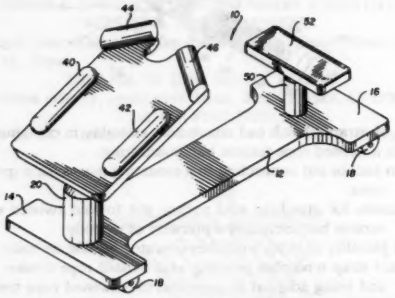
removed from the vehicle, serviced and replaced in substantially the same orientation as when it was removed.

5,009,407

SURGICAL TABLE FOR MICROSCOPIC LUMBAR LAMINECTOMY SURGERY

Robert S. Watanabe, 11645 Wilshire Blvd., Ste. 701, Los Angeles, Calif. 90025

Filed May 15, 1989, Ser. No. 352,058
Int. Cl.[5] A61G 13/00
U.S. Cl. 269—322 4 Claims



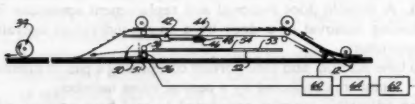
1. A surgical table for microscopic lumbar laminectomy, and spine surgical procedures, comprising: an elongated base having a first end and a second end; a first post mounted at the first end of said base and extending vertically upwardly from a horizontal plane of said base; a table top having a first end and a second end mounted on the upper end of said first post as a cantilever and supported at its first end by said post in an upwardly displaced position with respect to said base, said table top being angularly adjustable about a vertical ax of said first post and angularly displaceable relative to a second post mounted at the other end of said base and extending upwardly from the plane of said base; and a horizontal elongated leg support for the patient mounted on the upper end of said second post, longitudinally displaced from the second end of said table top and extending transversely with respect to the base said leg support being angularly adjustable about a vertical axis of said second post.

5,009,408

CONTINUOUS FEED BOARD INSERTER

Nicholas R. Pulskamp, 1616 Bushnell Ave., South Pasadena, Calif. 91030

Filed Mar. 16, 1989, Ser. No. 324,584
Int. Cl.[5] B65H 5/30
U.S. Cl. 270—57 20 Claims



1. An apparatus for injecting paper boards and like material into a continuous stream of interleaved paper sheets moving in a forward direction along a primary conveyance means, comprising:

means for lifting the paper stream from the primary conveyance means, the means for lifting providing continued forward movement and subsequently allowing the papers in the stream to fall back onto the primary conveyance means;

retaining means extendible into the path of the falling paper sheets to momentarily detain the trailing edges of the sheets from downward movement;

path clearing means for moving the trailing edges of the falling sheets not detained by the restraining means toward the primary conveyance means;

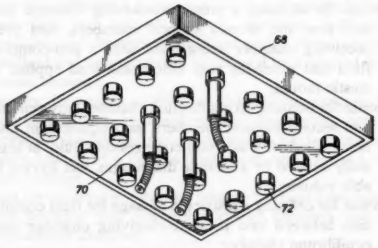
ejection means for feeding a paper board or like material into the space cleared in the falling sheets by the retaining means and the path clearing means and thus into the moving stream of papers.

5,009,409

METHOD AND APPARATUS FOR MANIPULATION OF FABRIC

Nazim S. Nathoo, Houston, Tex., and Fanis Giannopoulos, Scotch Plains, N.J., assignors to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 231,923, Aug. 15, 1988, abandoned.
This application Nov. 17, 1989, Ser. No. 437,316
Int. Cl.[5] B65H 3/08
U.S. Cl. 271—90 1 Claim



1. An apparatus for separating at least one curvilinear non-planar layer of porous fabric having a known periphery from a curvilinear non-planar stack of porous fabrics, said apparatus comprising:

a plurality of flow orientation adjustment means, each adjustment means having a first end and a second end, said first end having mount means operatively engaged to a flow locator, said second end having an end effector with a fluid opening defined therethrough, said mount means and said end effector flexibly connected to each other in a fluid tight manner by a moveable manually rebendable flexible tube having constant wall thickness, said tube manually rebendable to fixedly aim said end effector fluid opening into anticipated orthogonal contact with said curvilinear non-planar stack of porous fabrics, said fluid opening in fluid communication with a flow opening defined in a bottom surface of said flow locator, said end effector manually aimable to a desired orientation independent of any other end effector,

fluid movement means cable of moving fluid upward through said fluid opening and said flow opening, and

means for moving in unison said plurality of flow orientation adjustment means so as to fluid-couple each of said adjustment means to said at least one non-planar curvilinear layer, and to thereafter move said flow orientation adjustment means and said at least one non-planar curvilinear layer from said stack.

5,009,410

PAPER FEEDING SYSTEM FOR A SHREDDER

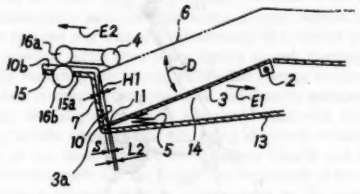
Yoshiharu Fujii, Sakurai, and Yukitoshi Fujita, Yamatokoriyama, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 371,655, Jun. 20, 1989, abandoned, which is a continuation of Ser. No. 103,214, Oct. 1, 1987, abandoned. This application Aug. 7, 1990, Ser. No. 563,948

Claims priority, application Japan, Oct. 3, 1986, 61-152797[U]; Jan. 13, 1987, 62-3755[U]

Int. Cl.[5] B65H *3/06*

U.S. Cl. 271—127 8 Claims



1. A paper feeding system for a paper shredder comprising: a paper rest rotatably provided around a support shaft of a main body for supporting paper to be shredded; a paper feed roller located above said paper rest; a baffle plate provided on said main body at a position juxtapositioned to a leading end face of said paper rest for preventing paper from shifting forward, there being provided a clearance between said end face and said baffle plate to allow said paper rest to rotate freely around said support shaft; paper stop ribs projecting from the surface of said baffle plate, running in the direction of rotation of said paper rest; and notches formed in said leading end of said paper rest with respect to the paper feeding direction of said paper rest corresponding to each of said paper stop ribs on said baffle plate, permitting said ribs to interlock with said notches when said paper rest is rotated.

5,009,411

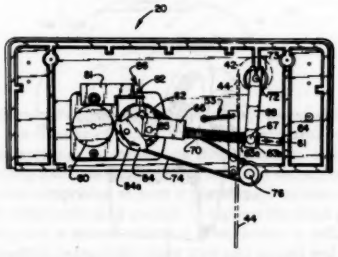
INPUT HOPPER APPARATUS

Donald J. Manderfeld, Richfield, and Robert A. Sells, Sells, both of Minn., assignors to DataCard Corporation, Minneapolis, Minn.

Filed Aug. 26, 1988, Ser. No. 237,214

Int. Cl.[5] B65H *1/08*

U.S. Cl. 271—129 2 Claims



1. An input hopper apparatus used with card members, the apparatus comprising:

(a) stacking means having a front end and a rear end for storing the card members in stacked configuration, the card members each having opposing facing major surfaces and a top, bottom, first, and second side edge, the card members resting on their bottom edges in the stacking means;

(b) biasing means for biasing the card members toward the front end of the stacking means;

(c) card picker means for separation of a lead card member proximate the front end of the stacking means, wherein a roller assembly proximate the first side edge of the lead card provides frictional force to the lead card member, thus propelling the card member from the input hopper, and wherein the roller assembly comprises a drive roller, a pinch roller and an index roller, the drive roller providing frictional shear force to the lead card member;

(d) a motor;

(e) drive linkage means intermounting the motor to the card picker means, wherein the drive linkage includes a drive pulley connecting to an elongated shaft, the elongated shaft being slidably intermounted to an extension arm of the drive linkage; and,

(f) shear force override means comprising a compressed spring positioned about the elongated shaft between the drive pulley and the extension arm, wherein the spring is continually compressed to drive the extension arm during a drive stroke.

5,009,412

EATHQUAKE SIMULATOR FOR A THEME PARK

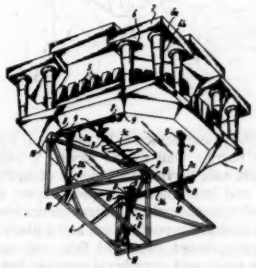
Joop Roodenburg, Delft, and Hendrik F. Roodenburg, Krimpen A/D Ijssel, both of Netherlands, assignors to Itrec B.V., Rotterdam, Netherlands

Filed Nov. 16, 1989, Ser. No. 438,267

Claims priority, application Netherlands, Nov. 16, 1988, 8802827

Int. Cl.[5] A63G *31/00*

U.S. Cl. 272—2 9 Claims



1. An earthquake simulator for a theme park which comprises:

a platform having a plurality of chairs securely attached thereto, said chairs provided with safety straps, and ears affixed to the platform;

an underframe spaced from the platform having ears affixed thereto;

at least three substantially vertical hydraulic cylinders having opposed ends, arranged in a triangle with one end of each cylinder affixed to the ears of the platform and with the opposed end affixed to the ears of the underframe;

means for movably attaching each hydraulic cylinder between an ear on said platform and an ear on said underframe; and

means for providing pressurized oil to said hydraulic cylinders,

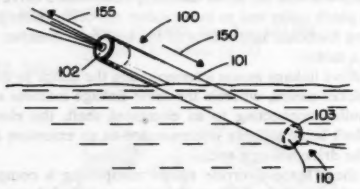
wherein the platform is movable with at least three independently driven degrees of freedom.

5,009,413

AQUATIC AMUSEMENT DEVICE

Tate C. Allen, 314 Cedar St., New Canaan, Conn. 06840

Filed Nov. 29, 1989, Ser. No. 443,711
Int. Cl.[5] E04H *3/16*
U.S. Cl. 272—1 B 20 Claims



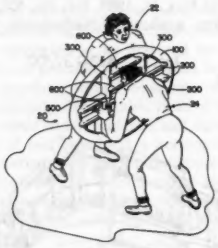
1. Apparatus for producing a spray of water, comprising:
(a) a tube; and
(b) a restriction device combined with said tube, to form an internal restriction at one end of said tube, wherein a spray of water is produced when the unrestricted end of said tube is forcibly thrust into a body of water.

5,009,414

EXERCISE SHIELD DEVICE, DIAGNOSTIC TOOL

Eric Bass, 10 Walton Ave., Doylestown, Pa. 18901

Filed Apr. 19, 1990, Ser. No. 510,922
Int. Cl.[5] A63B *69/34, 69/00*
U.S. Cl. 272—76 20 Claims



1. An exercise shield device to be used by at least one person comprising a barrier wall means having a pair of opposed gripping means, said barrier wall means comprising a peripheral member and interconnected spaced-apart members, said interconnected spaced-apart members comprising a first support means, a second support means, and a plurality of spaced-apart body engagement ribs, said first and second support means having ends, said peripheral member being fixedly secured to said ends of said first and said second support means, said gripping means being supported by said first support means, and said plurality of body engagement ribs supported by said second support means, all of which are somewhat cushioned.

5,009,415

RECREATIONAL GYMNASTIC APPARATUS

Juan M. Perez Blanco, Sevill, Spain, assignor to Internacional de Technicas y diseno, S.A., Sevill, Spain

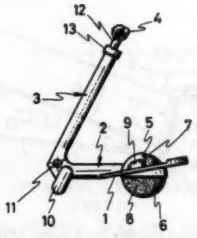
Filed Sep. 13, 1989, Ser. No. 406,731
Claims priority, application Spain, Sep. 16, 1988, 8802751; Sep. 30, 1988, 8802896; Jan. 5, 1989, 8900023
Int. Cl.[5] A63B *25/08*
U.S. Cl. 272—114 4 Claims

1. A recreational gymnastic apparatus of the type in which a user makes successive jumps generated by his body's impulses against and so as to cause the deformation of elastic means which, in their subsequent recovery, cause the combined effect of jumping and advancing of the apparatus, said apparatus, comprising:

a support body having an upright top section and a generally horizontal bottom section joined together to form an acute angle;

a support platform for the user mounted on the bottom section rearwardly of the top section;

the platform having one of an inlay and a housing with a generally hemispherical shape, a mouth facing downward and a window at the rear;



an elastic element including a rubber ball received in said mouth, which fits right in said housing through its mouth;

the window being formed in such a way that the ball rests only on the front half of the hemispherical shape; and

fastening means for the user's feet comprising hook means open on one side for receiving the front of a user's foot and a recess in the platform corresponding to the hook means for receiving the heel of the foot;

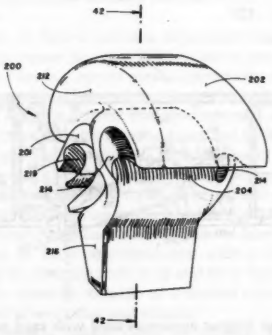
handle means for being grouped by the user formed at the top of said top section.

5,009,416

GRIP FACILITATING HANDLE

Scott Caruthers, Glen Burnie, Md., assignor to DAR Products Corporation, Baltimore, Md.

Continuation-in-part of Ser. No. 241,297, Sep. 9, 1988, Pat. No. 4,896,880, which is a continuation-in-part of Ser. No. 94,794, Sep. 14, 1987, Pat. No. 4,813,669. This application Mar. 20, 1989, Ser. No. 325,915
Int. Cl.[5] A63B *21/00*
U.S. Cl. 272—143 18 Claims



1. In combination with an apparatus having an existing handle, an auxiliary handle for the apparatus and means to detachably attach the auxiliary handle to the existing handle of the apparatus; such that when attached, the auxiliary handle is rigidly secured to the existing handle and is disposed radially outwardly of the existing handle, wherein a forceful grip is not required for the manipulation or control of the apparatus, the

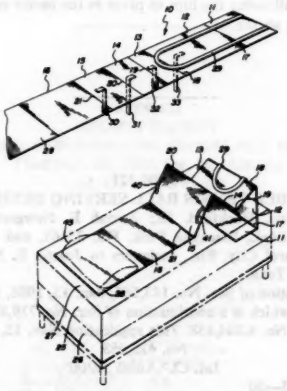
auxiliary handle being substantially unitary and rigid and having respective inner and outer walls defining a chamber therebetween, the auxiliary handle having an opening formed therein and communicating with the chamber for providing access for the user's hand, the chamber being closed internally of the auxiliary handle and limiting the degree of insertion of the user's hand through the opening and into the chamber, such that the user's hand is disposed in the chamber between the inner and outer walls of the auxiliary handle, the inner wall having a substantially convex inner surface, and the outer wall having a substantially concave inner surface, such that the palm of the user's hand substantially rests on the convex inner surface of the inner wall, and such that the back of the user's hand substantially confronts the concave inner surface of the wall, so that the user's hand is substantially in a curved natural at rest position rather than being tightly closed, thereby substantially reducing the human effort and energy required to manipulate or control the apparatus, and thereby substantially reducing the fatigue normally associated therewith and the existing handle of the apparatus being disposed radially inwardly of the inner wall of the auxiliary handle and being nested therein, such that the weight concentration of the existing handle is aligned radially with respect to the auxiliary handle and the user's hand therein.

5,009,417

ABDOMINAL EXERCISE DEVICE

Jeff Sarkozi, 1117 N. Avila Pl., Orange, Calif. 92669

Filed Jul. 31, 1990, Ser. No. 561,337
Int. Cl.[5] A63B *23/02*
U.S. Cl. 272—145 **10 Claims**



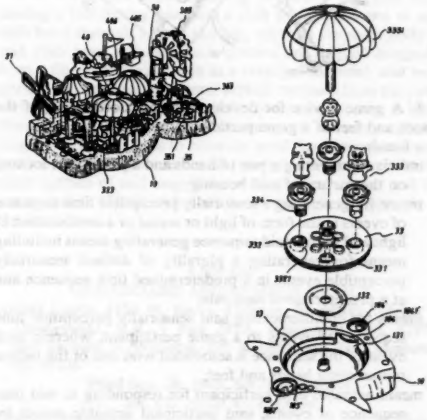
1. A portable exercise device for strengthening abdominal muscles and the like of a user, for use on a mattress and box-spring comprising: a plurality of sheet elements serially attached along fold liens having a first end and a second end; said second end comprising at least a plurality of sections one of which is sufficiently long enough to support the thigh portion of the leg and a second attached sheet which is sufficiently long enough to support the lower legs; said second end further comprising a foot securement means located and attached within the plurality of sheets designated as the second end, said first end comprising a body sheet serially attached along a fold line to the second end of the device; whereby, the exercise device is adapted for unfolding along the fold lines and assembly with the mattress and box-spring; for use in a sit-up exercise mode; for removal of the device from the mattress and box-spring; for folding up; and, for carrying or storage.

5,009,418

TOY INCLUDING FISHING GAME AND PASSIVE GAME ELEMENTS

Chuang Chuan-Tien, No. 40, Lane 174, Ta Hsin Street, Tainan, Taiwan

Filed May 25, 1989, Ser. No. 356,534
Int. Cl.[5] A63F *9/00*
U.S. Cl. 273—448 **13 Claims**



1. A toy having a participant-interactive game portion for active participation by game participants, and a noninteractive portion for visually entertaining said game participants, said toy including:

a supportive housing having a plurality of cavities;

of least one participant-interactive game pan having a plurality of vertically extending sockets and supported for rotation in a cavity of the plurality of cavities, said at least one participant-interactive game pan including a plurality of game targets positioned in individual sockets of the plurality of vertically extending sockets for access thereto by said game participants;

at least one noninteractive pan having a plurality of vertically extending sockets and supported for rotation in a cavity of the plurality of cavities for visually entertaining said game participants, each of said at least one noninteractive pan including a plurality of passive game pieces positioned for support in individual sockets thereof, a first one of said at least one noninteractive pan being operably connected to a sun gear positioned therebeneath whereby rotation of said first one of said at least one noninteractive pan causes rotation of said sun gear, and each of said plurality of passive game pieces positioned for support in said first one of said at least one noninteractive pan has a cylindrical gear formed on a bottom portion thereof for meshingly engaging with the sun gear such that rotation

of the sun gear causes rotation of each of the plurality of passive game pieces; and

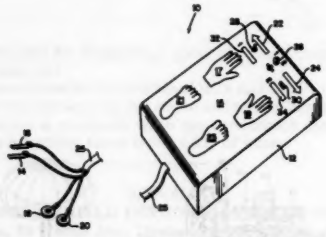
drive means including a motor and gear means for simultaneously rotating said at least one participant-interactive game pan and said at least one noninteractive pan.

5,009,419

MICROCOMPUTER CONTROLLED ROTATION GAME

Willie L. Streeter, 3318 Mount Pleasant St., NW., Washington, D.C. 20010

Filed Sep. 6, 1989, Ser. No. 404,951
Int. Cl.[5] A63F 9/24
U.S. Cl. 273—454 2 Claims



1. A game device for development of coordination of the hands and feet of a game participant, comprising:

a housing;

indicia representing a pair of hands and a pair of feet located on the surface of said housing;

means for generating a sensorially perceptible time sequence of events in the form of light or sound or a combination of light and sound, said sequence generating means including means for generating a plurality of distinct sensorially perceptible events in a predetermined time sequence and at a predetermined time rate;

means for communicating said sensorially perceptible time sequence of events to a game participant, wherein each event of the sequence is associated with one of the indicia representing hands and feet;

means actuable by a participant for responding to said time sequence of events, said participant actuable means including a plurality of manually operable controls, each associated with a single one of said distinct sensorially perceptible events and actuable by the participant in response to one of said distinct events, said participant actuable means including at least four separate controls wherein each of said controls requires actuation by a different one of said participant's hands and feet in response to a stimulus by the sensorially perceptible event and the indicia representing the hands and feet, whereby coordination is developed in the use of the hands and feet of the participant;

means coupled to said time sequence generating means and to said participant actuable means for determining the correctness of the participant's response, said correctness determining means including means for storing a representation of the generated sequence of events and means for comparing the stored sequences with the participant's response, said comparing means including means for providing an indication of the correctness or incorrectness of the response; and

means responsive to said indication of incorrectness for generating an error signal;

wherein said indicia are mounted so that said pair of hands and pair of feet define a generally circular pattern and wherein said sequence of sensorially perceptible events is selectively actuable so as to generate either a random pattern of said hands and feet indicia or a pattern of said hands and feet indicia which is clockwise or counter clockwise.

5,009,420

BATTING PRACTICE METHOD

Joseph M. Martelli, 4242 W. Oak, Fullerton, Calif. 92633

Filed Dec. 23, 1988, Ser. No. 290,147
Int. Cl.[5] A63B 69/40
U.S. Cl. 273—26 R 5 Claims

1. A batting practice method wherein a batter is to execute a batting stroke as though a ball were moving along a path from one location in a first direction and with the batter located along said path intermediate said one location and a fixed location, said method comprising:

positively restraining the hips of the batter with a device which is coupled to the batter and to said fixed location against significant movement toward said one location while allowing the hips to pivot as the batter executes the batting stroke.

5,009,421

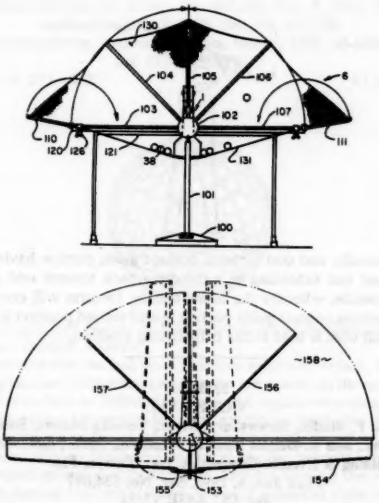
TABLE TENNIS BALL SERVING DEVICE

Gary Gatchel, Rockford, Ill.; Joseph E. Newgarden, 10931 Griffing Blvd., Biscayne Park, Fla. 33161, and Gordon E. Lynn, Carol City, Fla., assignors to Joseph E. Newgarden, Gallatin, Tenn.

Continuation of Ser. No. 143,565, Jan. 13, 1988, Pat. No. 4,917,380, which is a continuation of Ser. No. 719,872, Apr. 3, 1985, Pat. No. 4,844,458. This application Nov. 13, 1989, Ser. No. 425,053
Int. Cl.[5] A63B 39/00
U.S. Cl. 273—30 5 Claims

1. In a robot serving assembly, the improvement comprising net means, said net means including a central portion having a plurality of pivoting arms attached at one end to said central portion in close proximity to one another and extending radially outwardly from said central portion in different angular positions so as to be foldable into a collapsed positions immediately adjacent one another, said arms also being pivotally movable from collapsed to predetermined extended angular positions relative to said central portion, netting attached to and extending between said arms enabling said netting to be maintained in an open and extended position when said arms are moved to their predetermined extended angular positions, said netting also being attached to a trough device for receiving balls, said trough device being pivotally attached to said central portion and also being folded immediately adjacent said arms when collapsed to facilitate joint storage and carrying of

said folded trough device and collapsed arms, and a robot server operatively mounted relative to the trough device in



order to feed balls to said robot server when said trough device is in a opened, unfolded and extended position.

5,009,422

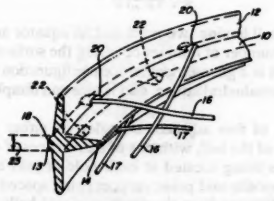
SPORTS RACKET

Tsai C. Soong, 1839 Jackson Rd., Penfield, N.Y. 14625

Filed Nov. 20, 1989, Ser. No. 438,862

Int. Cl.[5] A63B *49/02*

U.S. Cl. 273—73 D **9 Claims**



1. In a sports racket having a hand grip joined to a frame supporting a string network extending throughout a ball-hitting region spaced from the grip, the frame having a shank region projecting from the grip and flaring outward in a throat region and surrounding a generally oval ball-hitting region spanned by the string network composed of interconnecting strings, the improvement wherein the frame has a cross section including a first member in the plane of the said string network and a second member arranged approximately perpendicular to the said horizontal member, and whereas the majority of the strings of the string network enter and leave the frame at different levels of elevation away from the said plane of the string network, said strings wrapping said first member for support.

5,009,423

WOOD GOLF CLUB AND ITS PRODUCTION METHOD

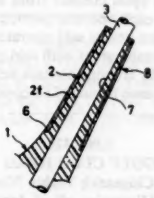
Takaharu Okumoto, Chigasaki; Tadashi Hayashida, Hiratsuka; Kazuo Kawada, Hiratsuka, and Tetsuo Hayashi, Hiratsuka, all of Japan, assignors to The Yokohama Rubber Co., Ltd., Tokyo, Japan

Filed Apr. 9, 1990, Ser. No. 506,214

Claims priority, application Japan, Apr. 10, 1989, 1-40963; Dec. 12, 1989, 1-320447

Int. Cl.[5] A63B *52/10*

U.S. Cl. 273—80.2 **11 Claims**



1. A wood golf club consisting essentially of a club head having a ball hitting face and a club shaft connected to said club head through a neck portion, wherein the main body of said club head and said neck portion are molded integrally from a fiber-reinforced resin as a principal material; said neck portion has an outer peripheral surface recessed from the outer surface of said club head main body through a step; a long-fiber-reinforced resin layer consisting of resin-impregnated long fibers wound so as to cross the axial direction of said neck portion is fitted over said outer peripheral surface; and the outer surface of said long-fiber-reinforced resin layer and the outer surface of said club head main body are substantially at the same level.

5,009,424

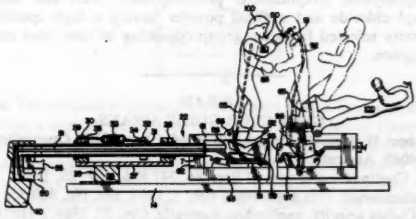
GAMEBOARD AMUSEMENT DEVICE

Arthur Harth, 4150 W. Barry, Chicago, Ill. 60641; Adrian T. Dowbrowski, R.R. 1 Box 251A, Remington, Ind. 47977, and Bernard O. Williams, 239 E. Northend Ave., Elmhurst, Ill. 60126

Filed Sep. 20, 1989, Ser. No. 409,804

Int. Cl.[5] A63F *9/14, 13/06*

U.S. Cl. 273—85 D **20 Claims**



1. A mechanically operated gameboard amusement device, comprising; in combination:

gameboard having a top playing surface with an accessible underside with a center play area defined by at least one opening in said surface;

a plurality of independent hollow cylinders, each having a pedestal end and a trigger end and extending continuously therebetween with each of said cylinders movably mounted under said gameboard;

pivot means for movably pivoting and slide mounting each of said cylinders under said gameboard;

operator means for grasping said trigger end of each of said cylinders;

actuator means for delivering mechanical force from said operator means to said pedestal end;

at least two contact figures pivotably mounted upright upon each of said pedestal ends through said opening, each of said contact figures having a contact figure pivot pedestal removably recessed within a fixed pedestal when said contact figure is positioned upright, and each having a plurality of movable arms cooperatively associated with said actuator means to deliver contact force to an opposing contact figure, said contact figures further defined by having release means for releasing said contact figures from said upright position to a position other than said upright position upon contact from an opposing contact figure, whereby each operator participating in play of said amusement device grasps said operator means and manipulates same in combination with said pivot means and said actuator means to attempt contact between said movable arms and said release means of an opposing contact figure.

5,009,425

GOLF CLUB HEAD

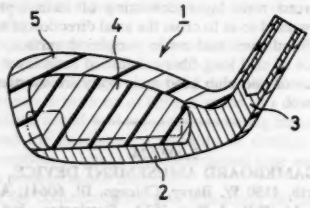
Takaharu Okumoto, Chigasaki; Toshio Ninomiya, Isehara, and Tstsuya Hayashi, Hiratsuka, all of Japan, assignors to The Yokohama Rubber Co., Ltd., Tokyo, Japan

Filed Oct. 27, 1989, Ser. No. 427,539

Claims priority, application Japan, Oct. 27, 1988, 63-269494; Aug. 28, 1989, 1-218519

Int. Cl.[5] A63B *53/04*

U.S. Cl. 273—167 R **4 Claims**



1. A wood-type golf club head comprising an outer shell consisting of a fiber reinforced thermosetting resin having the shape of a wooden golf club, a metal sole provided on a lower surface of said outer shell, and a core placed on an upper surface of said sole so as to be buried in the interior of said outer shell, said core being molded from a mixture of a thermoplastic resin selected from the group consisting of polyamide, polybutylene terephthalate, polypropylene, ABS and hard vinyl chloride and a metal powder having a high specific gravity selected from the group consisting of zinc, lead and tungsten.

5,009,426

GOLF CLUB GUIDE MEANS

Robert W. Cox, 33 Chapel Hill Road, Chapel Hill, Queensland 4069, Australia

Continuation-in-part of Ser. No. 347,886, Apr. 25, 1989, abandoned. This application Feb. 7, 1990, Ser. No. 480,531

Claims priority, application Australia, Oct. 27, 1986, PH8710 Oct. 27, 1987 [AU] Australia PCT/AU87/00363

Int. Cl.[5] A63B *69/36*

U.S. Cl. 273—186 A **13 Claims**

1. A golf club and guide bar assembly including a golf club and attached thereto a guide bar having mounting means at one end thereof rigidly and releasably attached to the shaft of said golf club, said guide bar having a forearm contact guide portion which slides over and is maintained in contact with the user's trailing forearm throughout a golf stroke and including contact at the backswing position and contact at the ball-striking position to provide an indication of the alignment of the golf club head relative to the user's trailing forearm, said forearm contact guide portion extending from a first position spaced from the golf club handle whereby the user's trailing forearm will contact the forearm contact guide portion at said first position when the golf club is held in the backswing position, to a second position adjacent the upper end of the golf

club handle, and said forearm contact guide portion having a terminal end extending in a direction back toward said golf club handle, whereby the user's trailing forearm will contact the forearm contact guide portion at said second position when the golf club is held in the ball-striking position.

5,009,427

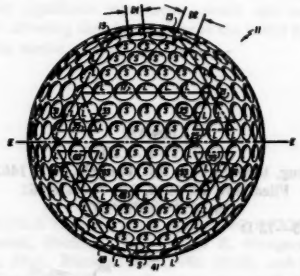
GOLF BALL

Joseph F. Stiefel, Shrewsbury, Mass.; Terence Melvin, Somers, Conn., and R. Dennis Nesbitt, Westfield, Mass., assignors to Spalding & Evenflo Companies, Inc., Tampa, Fla.

Filed Jun. 6, 1990, Ser. No. 534,087

Int. Cl.[5] A63B *37/14*

U.S. Cl. 273—232 **6 Claims**



1. A golf ball having two poles and an equator and having a preselected number of dimples covering the surface of the ball and arranged in a geometrical lattice configuration based upon a modified icosahedral lattice, said lattice and dimples comprising

a first set of five adjacent triangles on either side of the equator of the ball, with one of the vertices of each of said triangles being located at each pole of said ball and the sides opposite said polar vertices being spaced a predetermined distance from the equator of said ball;

a second set of five triangles smaller than said first set of triangles equally spaced about said ball between said first set of triangles and said equator of said ball, each of said second set of triangles having a vertex common with the lower vertices of two adjacent ones of said first plurality of triangles, with the leg opposite said common vertex being parallel to but spaced from said equator;

a first plurality of dimples having a diameter D1 lying along the lattice forming said first and second set of triangles;

a second plurality of dimples having a diameter D2 lying within the lattice of said first set of triangles and between the lattice of said second set of triangles;

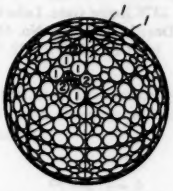
diameter D1 being greater than the diameter D2; and a dimple-free line about said equator.

5,009,428

GOLF BALL

Hisashi Yamagishi; Shinichi Kakiuchi, both of Yokohama, and Seisuke Tomita, Tokorozawa, all of Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 435,207, Nov. 4, 1989. This application May 2, 1990, Ser. No. 517,730
Claims priority, application Japan, Dec. 2, 1988, 63-305561
Int. Cl.[5] A63B *37/12*
U.S. Cl. 273—232 4 Claims



1. A golf ball having at least three types of dimples on the surface thereof, wherein

provided that the ball has a phantom spherical surface, three phantom orthogonal great circles are drawn on the spherical surface to define eight spherical regular triangles, and phantom perpendiculars are extended from the three apexes of each said spherical regular triangle to the opposite sides to divide the spherical regular triangle into six equal spherical right triangles, thereby dividing the entire spherical ball surface into 48 equal spherical right triangles,

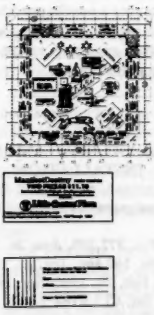
dimples are arranged on every two adjoining spherical right triangles such that the dimples are in axial symmetry with respect to the common side of the two adjoining spherical right triangles and the dimples do not intersect the great circles.

5,009,429

INVESTMENT GAME AND METHOD OF ADVERTISEMENT

David Auxier, 3148 Hewitt Ave., Apt. #155, Silver Spring, Md. 20906

Filed Jul. 5, 1990, Ser. No. 548,364
Int. Cl.[5] A63F *3/00*; G09F *23/14*
U.S. Cl. 273—240 25 Claims



10. A board game including a playing surface comprised of spaces to which player's tokens are moved according to chance selection during play, comprising:

reward means for players including at least one prize coupon with a redemption value comprised of an item selected from the group of real products and actual services;

said prize coupon including indicia which identifies businesses which have purchased the right to be included as part of the game as a means for advertisement, said purchases being the means for preselecting said prize coupons as integral to the game through normal, nonfantasy business practices involving the transfer of real value;

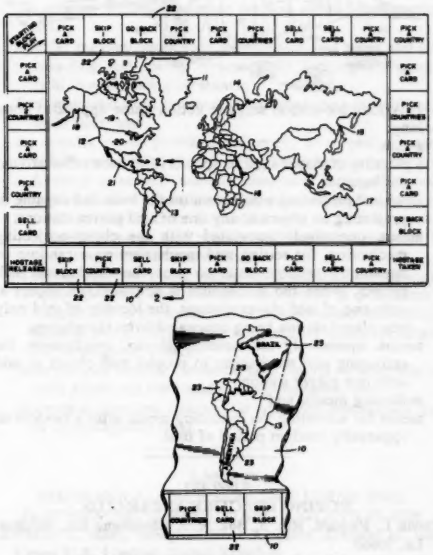
means for altering chance selected spaces during play of the game to dynamically alter said play; and a plurality of preselected cards including indicia on selected ones of said cards and said prize coupons representing business entities acquired by the players during the course of the game, acquisition of said spaces, said prize coupons, and said cards being achieved through a fantasy barter system by the players.

5,009,430

METHOD OF PLAYING A GEOGRAPHICAL MAP GAME

Donald E. Yuhasz, 802 S. Lucius Ave., Youngstown, Ohio 44502

Filed Sep. 10, 1990, Ser. No. 579,948
Int. Cl.[5] A63F *3/04, 9/10*; G09B *25/06*
U.S. Cl. 273—255 4 Claims



4. The method of playing a board game with at least one die having a number on each of its faces by a plurality of players comprising the following steps: providing a plurality of game board pieces representing countries, providing a plurality of game markers for said players' use, providing a plurality of playing cards bearing titles of military meanings and different point values, providing a game board having a plurality of playing regions representing continents, each of said playing regions further comprising a plurality of countries matching said game board pieces, providing a plurality of blocks on said game board bearing instructions, rolling said die and observing the number rolled, placing a game marker on one of said blocks on said game board as determined by said observed number, starting a timing device which times out when a predetermined length of time has elapsed, randomly selecting and placing a game board piece on said game board on the matching country in said playing region if the instructions on said block so state, picking a playing card from said plurality of playing cards if the instructions on said block so state, determining a total based

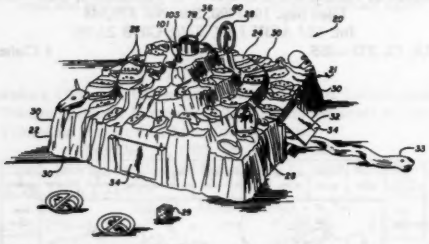
on the number of game board pieces placed correctly on matching countries on said game board before said predetermined length of time has elapsed and the total number of point values of the playing cards picked up and crediting said total to a player.

5,009,431

SURPRISE ACTION GAME

Adolph E. Goldfarb, 1432 S. Eastwind Cir., Westlake Village, Calif. 91361, and Martin I. Goldfarb, Santa Monica, Calif., assignors to Adolph E. Goldfarb, Westlake Village, Calif.

Filed Feb. 9, 1990, Ser. No. 477,637
Int. Cl.[5] A63F *3/00*
U.S. Cl. 273—258 16 Claims



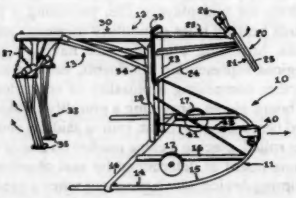
1. A multiple-station surprise action game apparatus comprising:
- a base;
- a plurality of player stations spaced from each other around the base;
- an object-projecting mechanism on the base and capable of projecting an object at any one of said player stations;
- means, operatively associated with the object-projecting mechanism, for setting said mechanism on a random or apparently random basis so that the mechanism will project, when the mechanism is activated, an object at only one of said player stations, the identity of said only one player station being concealed from the players;
- means, operatively associated with said mechanism, for activating said mechanism to project said object at said only one player station;
- indicating means; and
- means for activating the indicating means after a random or apparently random period of time.

5,009,432

ROPING PRACTICE APPARATUS

David L. Richard, Rte. 5, Box 3675, Choupique Rd., Sulphur, La. 70663

Filed Oct. 1, 1990, Ser. No. 590,724
Int. Cl.[5] A63B *69/00*
U.S. Cl. 273—339 5 Claims



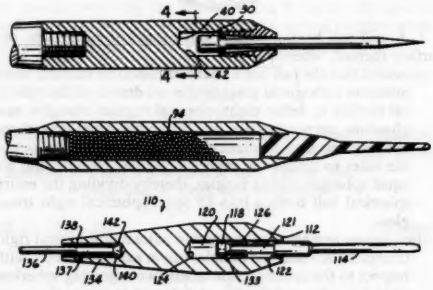
1. A roping practice apparatus for teaching team roping to heelers and headers wherein, the apparatus comprises:
- a wheeled support unit having at least one vertically disposed support column;
- a rear torso member fixedly secured to said at least one support column; wherein said rear torso member is further provided with at least one pivoted leg element;
- a quick release unit comprising a conventional quick release member disposed on said wheeled support unit and further provided with a main cable actuator member which extends from said quick release member to said at least one pivoted leg element.

5,009,433

DART FOR AIMING AT A GAME BOARD

Alexander D. Reid, 2378 Eaton Gate, Lake Orion, Mich. 48035

Filed Dec. 1, 1989, Ser. No. 444,674
Int. Cl.[5] A63B *65/02*
U.S. Cl. 273—419 12 Claims



1. A dart for aiming at a game board comprising:
- a body portion having a tail portion and spaced therefrom a point portion;
- the point portion being movable on a line with the horizontal longitudinal axis of the body portion and on a line with the vertical axis of the body so that the point can stick to the board and avoid obstructions on the board;
- wherein the body has a cavity in which the point portion moves as the point engages the target;
- a ramp situated at the rear of the cavity causes the point portion to move on a line with the vertical axis of the body when the dart strikes the target; and
- the point portion having a needle portion and a head portion wherein the head portion is retained in place by an elastomeric compressible engaging means which is in direct contact with the point portion.

5,009,434

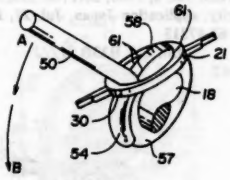
STRETCHABLE OIL SEAL AND METHOD OF INSTALLATION

Stephen E. Nash, Lakeland, and Gerald P. Pichler, Dearborn, both of Mich., assignors to Federal-Mogul Corporation, Southfield, Mich.

Division of Ser. No. 372,208, Jun. 26, 1989, which is a continuation of Ser. No. 149,466, Jan. 28, 1988, abandoned. This application Feb. 20, 1990, Ser. No. 481,280
Int. Cl.[5] F16J *15/00*
U.S. Cl. 277—1 3 Claims

1. A method for applying an annular elastomeric seal over a shaft flange and onto a shaft sealing surface using an installation tool, said flange extending radially outwardly and around a shaft, said tool having an outer peripheral arcuate surface and an inner peripheral grooved portion, said method comprising:
- engaging said grooved portion of said tool with said flange for guiding the movement of said tool about said flange;

engaging said seal with said arcuate surface of said tool and with a peripheral portion of said flange; and



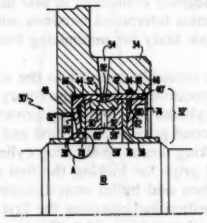
stretching said seal over said flange by pivoting said tool such that said seal is elongated at least about 100% of its unstretched length.

5,009,435

UNITARY SEALING SYSTEM WITH INTERNAL VENTING

Tibor J. Villanyi, Hanahan, S.C., and Kevin W. Westerson, Nashville, Ind., assignors to Cummins Engine Company, Inc., Columbus, Ind.

Filed Aug. 15, 1989, Ser. No. 393,881
Int. Cl.[5] F16J *15/32*
U.S. Cl. 277—23 **17 Claims**



1. A unitary seal device having a dual seal system for sealing around a rotatable shaft between the rotatable shaft and its cover to separate a region of higher pressure along the shaft on one side of the cover from a region of lower pressure along the shaft on the other side of the cover, said sealing system comprising:

an annular outer housing which forms an outer periphery of said unitary seal device, said annular outer housing having a radial through bore formed therein which divides said annular outer housing into an axially inner portion and an axially outer portion, said through bore operating to permit venting through said unitary seal device in the event of a sealing failure;

first and second seal elements each including a radially extending portion and an axially extending portion, each of said radially extending portions being spaced apart from the other to form a central channel and each of said axially extending portions including a shaft engaging surface adapted to sealingly engage the rotatable shaft around to entire circumference of the rotatable shaft;

filter means disposed in said central channel adjacent said through bore for preventing external contamination of said first and second seal elements; and

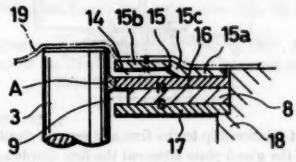
securing means for securing said first and second seal elements in position within said annular outer housing.

5,009,436

MAGNETIC FLUID SEAL ASSEMBLY

Mineyo Endo; Kiyoyoshi Takegami, both of Oumihachiman; Noriaki Hishida, Kyoto, and Itsuo Miyaji, Youkaichi, all of Japan, assignors to Nippon Densan Corporation, Kyoto, Japan

Filed Dec. 15, 1988, Ser. No. 284,736
Claims priority, application Japan, Jul. 11, 1988, 63-91670
Int. Cl.[5] F16J *15/40*; F16C *33/82*
U.S. Cl. 277—80 **9 Claims**



1. A magnetic fluid seal assembly which is arranged between a stationary central shaft and a rotor rotatable about said central shaft, said seal assembly comprising:

an annular sealing clearance formed around said central shaft;

annular magnetizing means mounted on said rotor and surrounding said sealing clearance for forming a magnetic field in said sealing clearance;

ferromagnetic fluid retained in said clearance by said magnetic field; and

an annular cover provided separately from and arranged axially outwardly of said magnetizing means, said cover forming a second annular clearance surrounding said central shaft at a position axially outwardly of said sealing clearance, said cover further forming an annular pocket located between said sealing and second clearances to open toward said central shaft;

wherein said cover and magnetizing means have adjacent, opposed faces, and wherein said cover is permanently magnetized in a manner such that said adjacent, opposed faces of said cover and said magnetizing means are identical in magnetic polarity;

wherein said second clearance is arranged substantially in axial alignment with said sealing clearance, and

wherein said second clearance is normally substantially free of ferromagnetic fluid.

5,009,437

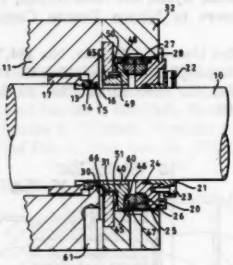
MECHANICAL FACE SEAL INCLUDING TWO DIAPHRAGMS SURROUNDING A GLAND PLATE

Anthony C. Back, Slough, United Kingdom, assignor to John Crane U.K. Limited, United Kingdom

Filed Apr. 25, 1990, Ser. No. 514,182
Claims priority, application United Kingdom, May 3, 1989, 8910106
Int. Cl.[5] F16J *15/36, 15/54*
U.S. Cl. 277—88 **9 Claims**

1. A seal for providing a fluid tight seal between a shaft and housing comprising a first seal face member mounted for rotation with the shaft, a second seal face member mounted on a carrier ring in axially opposed relationship to the first seal face member, a first annular radially extending diaphragm being secured at its outer periphery to a housing and at its inner periphery to the carrier ring, said first diaphragm providing a fluid tight seal between the housing and the carrier ring and being disposed on the high pressure side of the seal face members, a second resilient annular radially extending diaphragm being secured at its outer periphery to the housing, its inner periphery acting against the carrier ring to urge the second seal face member into sealing engagement with the first seal face member, said second diaphragm being disposed on the low pressure side of the first diaphragm, the first and second dia-

phragms being clamped to the housing with a gland plate therebetween, the gland plate extending radially inwardly in



juxtaposed relationship to the first and second diaphragms, the surface of the gland plate adjacent the first diaphragm limiting deflection of the first diaphragm.

5,009,438

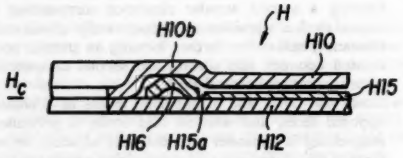
STEEL LAMINATE GASKET WITH ASSOCIATED BEADS

Tsunekazu Udagawa, Ichikawa, Japan, assignor to Ishikawa Gasket Co., Ltd., Tokyo, Japan

Division of Ser. No. 194,376, May 16, 1988. This application Oct. 10, 1989, Ser. No. 419,328

Int. Cl.[5] F16J *15/08*

U.S. Cl. 277—235 B 5 Claims



1. A steel laminate gasket for an internal combustion engine having at least one hole therein, comprising:

a first plate having at least one first hole corresponding to the hole of the engine, at least one first bead situated around the first hole and having a flat top portion, and a main portion situated outside the first bead and extending substantially throughout the entire area of the engine, said first bead further having height between an outer surface of the main portion and an outer surface of the flat top portion and width between an outwardly extending portion adjacent the first hole and an outwardly extending portion adjacent the main portion, said width being greater than said height thereof,

a second plate situated under the first plate and having at least one second hole surrounding the hole of the engine,

support means in the form of an annular shape and including at least one second bead, said second bead being situated above the second plate and beneath the first bead so that when the gasket is tightened, the second bead of the support means abuts against a part of the flat top portion of the first bead and partly supports the first bead to thereby provide wide, strong and even sealing pressure by means of the first and second beads, and

a third plate having at least one third hole with a diameter which is substantially the same as an outer configuration of the first bead surrounding the first hole, said third plate being situated between the first and second plates, said second bead of the support means being situated between the first bead and the second plate within the third hole of the third plate.

5,009,439

CHUCK FOR TOOLS

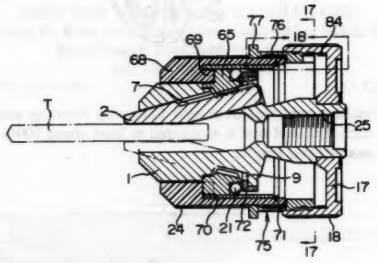
Iwao Sakamaki, Ojiya, Japan, assignor to Sakamaki Mfg. Co., Ltd., Ojiya, Japan

Filed Jul. 8, 1988, Ser. No. 216,754

Claims priority, application Japan, Jul. 21, 1987, 62-181563; Feb. 29, 1988, 63-47315

Int. Cl.[5] B23B *31/12*

U.S. Cl. 279—62 2 Claims



1. A chuck for tools comprising,

a main body with an axially extending hole through said main body defining a longitudinal axis of the chuck,

a plurality of oblique slots in the main body converging on said longitudinal axis to act as guides for jaw members,

a plurality of jaws slidably received in said oblique slots, each of said jaws provided with an outer surface and a male thread portion,

a rotary member having a female thread portion in meshing engagement with each of said male thread portions of said jaws and rotatably mounted on said main body,

a first grip integrally connected to said main body,

ball bearing mass interposed between said rotary member and said main body for minimizing friction between the two,

a second grip rotatably coupled to the rotary member for applying a rotative torque to the rotary member,

a buffer stop cylinder longitudinally movable relative to said first and second grips between first and second position,

releasable locking means on the stop cylinder and said first and second grips for locking the first and second grips together when said buffer stop cylinder is positioned in said first position and releasing the first and second grips from each other when said buffer stop cylinder is positioned in said second position.

5,009,440

TOOL CHUCK FOR TOOL BITS

Erwin Manschitz, Germering, Fed. Rep. of Germany, assignor to Hilti Aktiengesellschaft

Filed May 24, 1988, Ser. No. 198,046

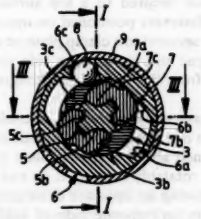
Claims priority, application Fed. Rep. of Germany, May 25, 1987, 3717614

Int. Cl.[5] B23B *31/10*

U.S. Cl. 279—71 7 Claims

1. A tool chuck for holding a tool with an axially extending shank end having at least one axially extending groove thereon, said at least one axially extending groove having closed opposite ends, said tool chuck comprising an axially extending guide tube having an inside surface and an outside surface, an adapter sleeve enclosing at least an axially extending part of said guide tube and being rotatable relative to said guide tube about the axis thereof, and locking elements and entrainment strips mounted for rotation with the guide tube and for selective displacement radially inwardly by said adapter sleeve into at least one groove of the tool, wherein the improvement comprises a holding segment with one said locking element and one said entrainment strip thereon spaced apart in the circumferential direction of said adapter sleeve and

the mounting of said holding segment with said one locking element and said one entrainment strip comprising a through opening extending between the inside surface and the outside surface of said guide tube, said holding segment being radially



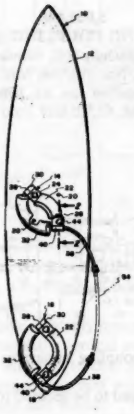
displaceable through said through opening by said adapter sleeve and said adapter sleeve arranged and adapted for selective radially inward displacement of said locking element or both of said locking element and entrainment strip of said holding segment.

5,009,441

SKI BOARD BINDING

Lonnie P. Toft, 345 Arcade Dr., Ventura, Calif. 93003

Filed May 21, 1990, Ser. No. 525,615
Int. Cl.[5] A63C *9/083, 5/03;* B63B *35/79, 35/81*
U.S. Cl. 280—14.2 **8 Claims**



1. A releasable binding for mounting a foot of a human being onto a structure designed for movement on the surface of the earth, said binding comprising:

a binding assembly composed of a heel strap assembly and an instep strap assembly, said heel strap assembly adapted to be located across the heel of a human foot, said instep strap assembly having a first end and a second end and adapted to be located across the instep of the human foot, said heel strap assembly including an elastic cord, said elastic cord having a first terminal fixedly connected to said first end and a free end adapted to be manually grasped and longitudinally movable from an at-rest position to a stretched position, said elastic cord being mounted in a tube of fixed cross-section and fixedly secured to said second end of said instep strap assembly, with said free end in said at-rest position said elastic cord being of a thickness tightly frictionally engaging with said tube effectively securing together said tube and said elastic cord, with said free end in said stretched position the thickness of said elastic cord is decreased which permits longitudinal sliding movement between said elastic cord and said tube so that said heel strap assembly is to be snugly secured against the heel of the human foot, upon manual release of said free end said heel strap assembly maintains said binding against the heel.

5,009,442

TRANSPORTATION OF HOSPITAL PATIENTS

Karl D. Schneider, 608 Hickory Cir., Canonsburg, Pa. 15317

Continuation-in-part of Ser. No. 223,266, Jul. 12, 1988, Pat. No. 4,840,391, which is a continuation-in-part of Ser. No. 40,989, Apr. 20, 1987, abandoned. This application Jun. 16, 1989, Ser. No. 367,379
Claims priority, application Japan, Nov. 4, 1987, 277,492/87
The portion of the term of this patent subsequent to Jun. 20, 2006, has been disclaimed.
Int. Cl.[5] A47C *7/62*
U.S. Cl. 280—304.1 **9 Claims**

7. Apparatus for joining a wheelchair to an IV unit of the kind having an upstanding pole or standard mounted for freewheeling movement, said apparatus comprising an elongated means having at a first end thereof a means for latchingly engaging said pole or standard and extending along a length of pole for guided longitudinal movement by the pole said elongated means including two arcuate segments which are connected by a hinge and releasably held in a tubular form by latch means, means supported by one of said arcuate segments for squashing against said pole thereby passing the opposite side of said pole against the other arcuate segments to restrain said pole against rotary movement with respect to said (hemicylindrical pieces) arcuate segments.

5,009,443

BALL-TIP STUD AND ALIGNMENT TOOL AND METHOD OF USE

George F. Howatt, Chapin Rd., Holden, Mass. 01520

Filed Dec. 28, 1989, Ser. No. 458,221
Int. Cl.[5] B60D *1/36;* A01B *51/00*
U.S. Cl. 280—477 **16 Claims**

1. An assembly to facilitate coupling of an implement to a hitch assembly tractor draw bar of a multi-point hitch, said assembly comprising:

a stud forming a part of said multi-point hitch and having an elongate cylindrical body and a spherical tip member

attached at a first end thereof, said stud being mechanically coupled at a second end thereof to said implement;

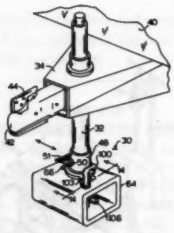
an alignment tool having an elongate cylindrical body and a cavity extending longitudinally through a portion of said tool body at a first end thereof, said cavity having a shape adapted to received said spherical tip member so as to releasably and pivotally couple said stud and said alignment tool.

5,009,444

SLIDEABLE JACK STAND

Thomas M. Williams, Jr., 2310 Old Oxford Hwy., Durham, N.C. 27704

Filed Sep. 21, 1989, Ser. No. 410,370
Int. Cl.[5] B60D *1/00*
U.S. Cl. 280—477 **8 Claims**



1. A trailer hitch alignment device comprising:

(a) a ground support structure providing an elevated flat horizontal wall;

(b) a socket member opening upwardly of said wall and having a base portion dimensioned to receive a lower end of a conventional trailer jack shaft;

(c) means for supporting said socket member on said wall and providing a substantially low friction sliding support; and

(d) means for guiding and limiting travel of said socket member on said wall to permit limited lateral and longitudinal sliding movement of said jack shaft when mounted in said socket member comprising:

(i) an elongated guide slot formed in said wall and providing a vertical passage therethrough bounded by a continuous flat, vertical edge, said edge being shaped so as to make a middle of the passage relatively narrow and ends of the passage relatively wide; and

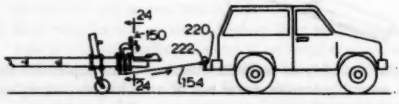
(ii) a guide member secured to said socket member base portion and passing through said low friction sliding support and said passage, said guide member being operative by contacting said edge to permit both limited lateral and longitudinal sliding of said socket member and said jack shaft mounted therein on said wall as required to facilitate trailer hitch alignment.

5,009,445

TRAILER HITCH CABLE PULLER

Thomas M. Williams, Jr., 2310 Old Oxford Hwy., Durham, N.C. 27704

Filed Oct. 3, 1989, Ser. No. 416,720
Int. Cl.[5] B60D *1/38*
U.S. Cl. 280—477 **3 Claims**



1. A clamp-on trailer alignment device mountable on a tongue of a trailer having a ball socket, the tongue being formed of a hollow channel of rectangular cross section, comprising:

(a) a winding cable having an outer end fitted with means for engaging a ball mount on a towing vehicle;

(b) a winching mechanism comprising:

(i) a base plate secured to a top surface of the trailer tongue by fasteners positioned on opposite sides of the tongue and secured to a clamp plate on a bottom surface of the tongue and including a side portion extending outwardly from one side of said tongue and having an aperture;

(ii) a drum assembly including a cable drum fixedly mounted on one driven end of a shaft and supported on and positioned above said base plate side portion, said shaft being rotatably supported on and above said base plate and having an opposite drive end extending outwardly from an opposite side of said tongue with a handle mounted on said opposite shaft drive end;

(c) a pulley assembly including a vertical tubular housing secured at an upper end to a bottom surface of said base plate side portion below said aperture and extending downwardly from said base plate to a lower end and a cable pulley mounted in said lower end of said tubular housing; and

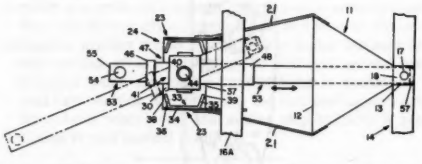
(d) said cable extending from said drum through said aperture downwardly through a cavity formed by said tubular housing, over said pulley and from the pulley to the ball mount enabling a run of cable between said pulley and the ball mount to extend at an upward angle to thereby give a lifting effect to the front of said tongue.

5,009,446

SELF ALIGNING COUPLING APPARATUS

Darrel B. Davis, 170 Macleay Rd., Sequim, Wash. 98382

Continuation of Ser. No. 318,764, Mar. 3, 1989, Pat. No. 4,893,829. This application Jan. 12, 1990, Ser. No. 464,176
Int. Cl.[5] B60D *1/00*
U.S. Cl. 280—479.2 **3 Claims**



1. A self-aligning coupling apparatus for mounting on a vehicle comprising:

a first housing arranged to be secured to the underside of the vehicle,

a dual gimbal housing supported in said first housing for rotatable adjustment in horizontal and vertical directions,

an elongated coupler member having front and rearward ends,

said coupler member being slidably supported in said dual gimbal housing for rotatable and longitudinal adjustable movement with said gimbal housing for connection to a randomly located mating coupler member,

a funnel-shaped guide arranged to be secured to the underside of the vehicle,

said funnel-shaped guide having a large open front end facing said first housing and a smaller rearward end,

said funnel-shaped guide being arranged to slidably receive the rearward end of said coupler member in its rotatably adjusted position and slidably guide the rearward end into the smaller end of the funnel-shaped guide for aligning the elongated coupler member longitudinally with the vehicle,

said first housing including guide means therein that direct

said coupler member slidably into said open front end of said funnel-shaped guide,

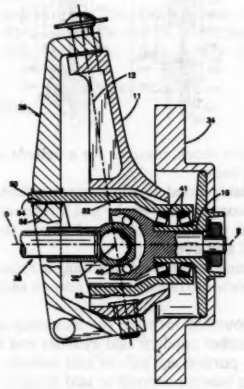
and latch means associated with the smaller end of said funnel-shaped guide for securing the elongated coupler member in a coupled and aligned position.

5,009,447

ZERO CAMBER STEERING SUSPENSION

Dewitt Gabel, 11018 Blodgett Creek Trail, Strongsville, Ohio 44136

Filed Jul. 5, 1989, Ser. No. 375,711
Int. Cl.[5] B62D 17/00
U.S. Cl. 280—661 6 Claims



1. In a dirigible wheel axle assembly for supporting a wheel of a vehicle, said wheel, when supported on said axle assembly, having a rotation axis, a caster angle, and a camber angle, said axle assembly comprising:

(a) a suspension spindle rotatably mounted to rotate about an inclined but substantially vertical steering axis;

(b) an axle housing attached to said spindle;

(c) a stub axle for supporting said wheel for rotation about said rotation axis of said wheel;

(d) means for rotatably securing said stub axle to said axle housing;

and wherein said axle assembly may also include drive means including a universal joint, said drive means comprising a connection to a drive shaft that is connected to a source of motive power to rotate said shaft about an axis thereof and thereby to rotate said wheel;

wherein the improvement comprises of attaching said axle housing to said spindle by means that allow rotation of said axle housing on a substantially horizontal camber pivot axis that intersects at substantially the same point the said steering axis and the said rotation axis of said wheel and, when a drive means is present, also said axis of said drive shaft;

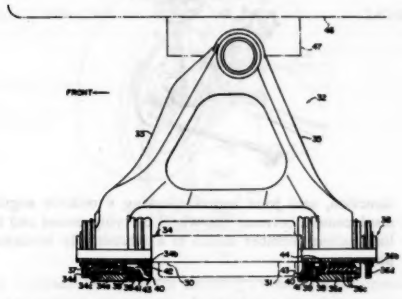
and wherein the improvement further comprises providing control means to restrict and control the rotation of said axle housing on said camber pivot axis, thereby providing control of said camber angle independent of any steering axis inclination and caster angle.

5,009,448

VEHICLE SUSPENSION SYSTEM

Takao Kijima; Takeshi Edahiro; Toshihide Koyama, and Haruyuki Taniguchi, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Apr. 27, 1989, Ser. No. 343,820
Claims priority, application Japan, Apr. 30, 1988, 63-108765
Int. Cl.[5] B60G 7/02
U.S. Cl. 280—673 21 Claims



1. A suspension system for a vehicle comprising a suspension arm having an outer end portion which is connected to a wheel support for rotatably supporting a wheel and an inner end portion which is bifurcated and comprises first and second branch arms spaced from each other in the longitudinal direction of the vehicle body, a pair of slide members which respectively support the inner end portions of the first and second branch arms so that the inner end portions are slidable relative to the vehicle body in the longitudinal direction of the same, a coil spring which is provided for at least one of the first and second branch arms and urges forward the suspension arm so that said inner end portions of the first and second branch arms can slide rearward in opposition to the coil spring in response to rearward loading input through the wheel which acts on the inner end portion of the suspension arm, and a stopper means which defines the forewardmost position of the suspension arm which is urged forward by said coil spring, wherein said coil spring applies a forward bias force toward and against said stopper, thereby improving the driving comfort when a vehicle passes a gap and rearward loading acts on the inner end of the suspension arm.

5,009,449

VEHICLE REAR SUSPENSION SYSTEM

Takeshi Edahiro, Higashihiroshima, and Seita Kanai, Hiroshima, both of Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Jul. 24, 1989, Ser. No. 383,656
Claims priority, application Japan, Jul. 27, 1988, 63-187492; Jul. 27, 1988, 63-187493; Jul. 29, 1988, 63-188362
Int. Cl.[5] B60G 3/00
U.S. Cl. 280—690 17 Claims

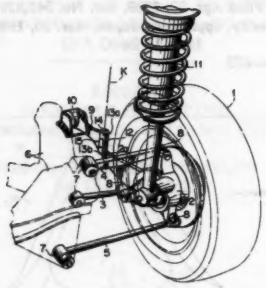
1. A vehicle rear suspension system comprising:

wheel carrying means for rotatably carrying a wheel of a vehicle,

a plurality of lateral member means, each of said lateral member means extending in a transverse direction of the vehicle and connected to a vehicle body at its inner end and to the wheel carrying means at its outer end, and

longitudinal member means extending in a longitudinal direction and connected to the vehicle body at its front end for pivotal movement and to the wheel carrying means at its rear end through joint means, the joint means being located in one of first and second positions, said first position being located on a substantially straight line extending through both a front connecting point between

the longitudinal member means and the vehicle body and a wheel center, said second position being located outward of the substantially straight line in the transverse



direction, said joint means allowing a relative angular displacement between the wheel carrying means and the longitudinal member means in a substantially horizontal plane.

5,009,450

VIBRATION-ABSORBER SENSOR FOR A SEMI-ACTIVELY CONTROLLED CHASIS WITH A RELATIVE-VELOCITY SENSOR AND WITH ELECTRONICS FOR PROCESSING THEIR OUTPUTS

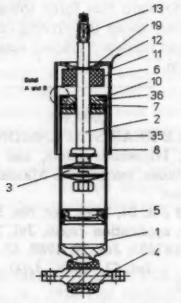
Gerhard Herberg, Menden; Hans-Jürgen Hoffmann, Wuppertal; Ludger Gesenhues, Dortmund; Zhen Huang, Wuppertal, and Reinhard Höscher, Salzkotten, all of Fed. Rep. of Germany, assignors to August Bilstein GmbH & Co. KG, Ennepetal, Fed. Rep. of Germany

Filed Mar. 5, 1990, Ser. No. 488,703

Claims priority, application Fed. Rep. of Germany, Mar. 21, 1989, 3909190

Int. Cl.[5] B60G *11/26*

U.S. Cl. 280—707 **6 Claims**



1. A vibration-absorber sensor for measuring relative velocity between a motor vehicle body and axle, comprising: a wheel suspension; a variable or controllable hydraulic vibration absorber having an absorber cylinder at one end connected to said wheel suspension, said hydraulic vibration absorber having a moving piston rod at another end connected to said body and traveling in and out of said cylinder; a stationary housing open at one end and matching the shape of said cylinder and forced over said cylinder, said housing secured to said piston rod; an absorption valve and a processing circuit connected to said valve for varying or controlling said valve; said housing being made of anti-magnetic material and accommodating a sensor winding with leads extending outward; a magnet positioned at an untensioned end of said cylinder and on the surface of a cap of said cylinder; velocities of said piston including a distance-dependent and direction-dependent voltage signal in said sensor winding; said processing circuit supplying a signal for varying or controlling the absorption valve in accordance with the particular relative velocity of the piston.

5,009,451

SHOCK ABSORBER FOR USE IN A VEHICLE

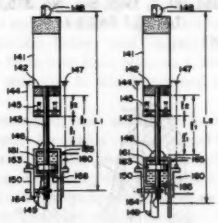
Yasuyuki Hayashi, Fukuroi, and Shigenobu Abe, Hamamatsu, both of Japan, assignors to Kabushiki Kaisha Showa Seisakusho, Tokyo, Japan

Filed Jul. 7, 1989, Ser. No. 376,879

Claims priority, application Japan, Jul. 19, 1988, 63-178131; Aug. 19, 1988, 63-108291[U]; Sep. 14, 1988, 63-119876[U]

Int. Cl.[5] B60G *11/14*

U.S. Cl. 280—724 **3 Claims**



1. A hydraulic shock absorber for a vehicle comprising:
a damper cylinder;
a piston slidably fitted in said damper cylinder, said piston having a compression stroke and a rebound stroke;
a piston rod extending from said piston through an end portion of said cylinder;
a first mounting member for mounting a cylinder end of said shock absorber to one of a body portion and an axle of said vehicle;
a second mounting member for mounting an end of said shock absorber opposite said cylinder end to the other of said body portion and axle of said vehicle;
a first spring bearing secured to said damper cylinder;
a second spring bearing secured to said piston rod;
a suspension spring interposed between said first and second spring bearings; and,
height adjusting means for changing the spacing between said first and second mounting means by changing the compression stroke of said piston with neither the rebound stroke of said piston nor the spacing between said first and second spring bearings changing.

5,009,452

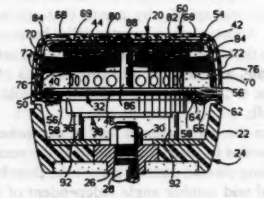
OCCUPANT RESTRAINT SYSTEM

Gregory A. Miller, Troy, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 19, 1990, Ser. No. 511,363

Int. Cl.[5] B60R *21/22*

U.S. Cl. 280—730 **12 Claims**



1. An occupant restraint system comprising, support means,

an occupant restraint cushion mounted to the support means and including an upper wall portion, a lower wall portion, and spaced side wall portions intermediate the upper and lower wall portions, each side wall portion having a number of folds, planar reaction means mounted on the support means and located between the upper wall portion and the folds of the side wall portions immediately adjacent thereto, and means releasably securing such immediately adjacent folds to the reaction means during initial inflation of the cushion from a source of pressure fluid to restrict such initial deployment laterally of the occupant by unfolding of the folds of the side wall portions, other than the secured folds, while maintaining the upper wall portion generally stationary.

5,009,453

WEBBING GUIDING STRUCTURE FOR AUTOMOBILE SEAT BELT SYSTEM

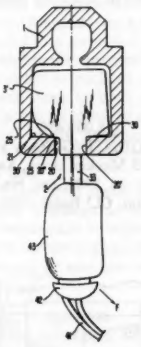
Katsuyasu Ono, Chigasaki, Japan, assignor to Nippon Seiko Kabushiki Kaisha, Japan

Continuation-in-part of Ser. No. 196,065, May 17, 1988, Pat. No. 4,871,191. This application Jul. 24, 1989, Ser. No. 383,657

Claims priority, application Japan, May 20, 1987, 62-75483[U]

Int. Cl.[5] B60R *22/06*

U.S. Cl. 280—804 **7 Claims**



4. In a webbing guiding structure for an automobile seat belt system, said structure including a slide rail, a movable runner displaceable along the slide rail and a webbing fastened to the movable runner, the improvement wherein the slide rail defines a slide surface for allowing the movable runner to run on the slide surface, the movable runner is provided with a slidable shoe having a contact surface which is brought into contact with the slide surface of the slide rail, the slidable shoe is received within the slide rail, the movable runner extends outwardly at a part thereof through a slot formed in the rail, the webbing is connected to the outwardly-extending part of the movable runner, and the slide surface of the slide rail and the associated contact surface of the slidable shoe are formed in such a way that when the movable runner is brought into contact with one of the edges of the slot upon receipt of a pulling force from the webbing the interval between the slide surface extending from said one edge of the slot on the same side as the side, on which the pulling force has been applied from the webbing, and the associated contact surface are in contact with each other at said one edge but the interval therebetween increases as the distance from the edge becomes greater.

5,009,454

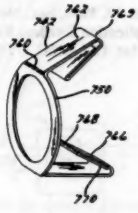
SWIVELABLE QUICK CONNECTOR ASSEMBLY

Donald D. Bartholomew, Marine City, Mich., assignor to Proprietary Technology, Inc., Southfield, Mich.

Division of Ser. No. 99,654, Sep. 21, 1987, abandoned, which is a continuation of Ser. No. 776,642, Sep. 16, 1985, abandoned, and a continuation-in-part of Ser. No. 360,201, Mar. 22, 1982, Pat. No. 4,601,497, which is a continuation-in-part of Ser. No. 201,711, Oct. 29, 1980, Pat. No. 4,423,892. This application Jan. 12, 1989, Ser. No. 296,232

Int. Cl.[5] F16L *35/00*

U.S. Cl. 285—24 **7 Claims**



1. A retainer element for securing a conduit in a connector having at least one window for enabling visual inspection of the conduit through the window, the retainer element comprising:

a collar means, said collar means having an aperture therethrough for passage of the conduit;

at least one deflectable leg means projecting from said collar means, said leg means being bent to form at least one integral means for securing the conduit in said retainer element and in the connector;

said leg means having a first portion projecting from said collar means, a first bend and first retaining portion for securing said retainer element in the connector, and a second bend and second retaining portion for securing the conduit in said retainer element; and

means on said collar means for rotationally orientating said leg means with respect to the window.

5,009,455

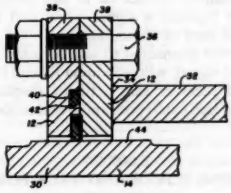
SEAL

Bruce W. Irvine, 856 Andover Crescent, West Vancouver, British Columbia, Canada V7S 1Y5 , and Bruce G. R. Irvine, 2908 Dickerson Place, Victoria, British Columbia, Canada V9B 2G7

Filed Dec. 5, 1989, Ser. No. 446,507

Int. Cl.[5] F16L *17/00*

U.S. Cl. 285—106 **9 Claims**



1. A sealed joint between two relatively movable surfaces comprising:

a recess in a first surface;

a sealing member received in the recess with a clearance, the sealing member having a modulus of elasticity such that it does not substantially deform under a predetermined external pressure;

the sealing member extending to contact the second surface;

a sealing ring received in the recess to provide an additional seal for the joint;

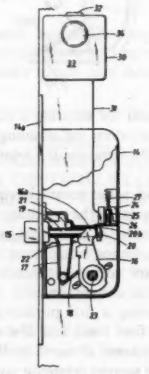
whereby pressure applied to one side of the joint can act on that side of the sealing member remote from the second surface to force the sealing member against the second surface, the end of the sealing member being of reduced area where it contacts the second surface to reduce the area of contact with the second surface.

5,009,456

DOOR LOCK APPARATUS

Berth Eck, Bollebygd, Sweden, assignor to Lasinvast Svenska AB, Sweden

Filed Jan. 30, 1990, Ser. No. 472,202
Claims priority, application Sweden, Feb. 10, 1989, 8900450
Int. Cl.[5] E05C 1/16
U.S. Cl. 292—173 13 Claims



1. A door lock apparatus comprising,

a latch bolt,

first spring means for biasing said latch bolt into a latching position,

a door handle driver for retracting said latch bolt from said latching position to a retracted position,

catch means displaceable between a catch position for retaining said latch bolt in said retracted position and an inoperable position,

second spring means for biasing said catch means into said catch position,

an actuator for displacing said catch means from said catch position to said inoperable position,

an alarm detector remotely placed from said lock apparatus for detecting a state of alarm,

a signal transmitter connected to said alarm detector and adapted to transmit a signal when said alarm detector detects said state of alarm, and

a signal receiver connected to said actuator and adapted to receive said signal, whereby upon receipt of said signal by said signal receiver said actuator displaces said catch means from said catch position to said inoperable position.

5,009,457

LOAD BEARING COVER AND RACK FOR A PICK-UP TRUCK

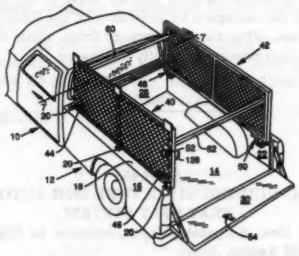
David E. Hall, 2085 S. Sylvan, West Linn, Oreg. 97068

Filed Jan. 16, 1990, Ser. No. 465,762
Int. Cl.[5] B60P 3/00, 7/00
U.S. Cl. 296—3 10 Claims

1. A cover for a pick-up truck bed, said cover convertible into a rack, said pick-up truck bed having a fixed floor, a movable tailgate, a pair of fixed spaced apart vertical side walls attached to said floor, each of said side walls having an inside and a top, and a front wall interconnecting said floor and said side walls, said convertible cover comprising:

a pair of panels;

attachment means to pivotally attach said pair of panels one to each side of the inside of the side walls of the pick-up bed, said attachment means allowing said panels to pivot from a closed position with a top surface of each of said panels being flush with the top of the side walls to form



said cover for the pick-up bed, to a vertical open position parallel with said side walls to form said rack; and

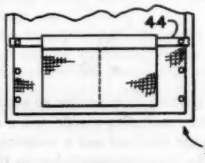
a pair of transverse load support means selectively moveable from a first position in engagement with said attachment means to underlay said panels when said panels are in the closed position, to a second position in engagement with said panels when said panels are in an open position, to restrain said panels in said open position.

5,009,458

POUCH FOR MOUNTING TO A VEHICLE DOOR

Thomas A. Shute, 5055 Meeker Drive, Kalama, Wash. 98625

Filed Apr. 24, 1989, Ser. No. 342,739
Int. Cl.[5] B60R 7/04
U.S. Cl. 296—37.13 6 Claims



1. A method of mounting a pouch on a vehicle door comprising a frame, an inside panel, and screws securing the inside panel to the frame by engagement with respective screw holes in the frame, said method comprising:

(a) selecting two screws at opposite respective edges of the panel,

(b) providing an elongate mounting bracket having two opposite ends and having a hole adjacent each end, the distance between the holes in the bracket being substantially equal to the distance between the selected screws, and the bracket being coupled to the pouch,

(c) removing the selected screws from their respective screw holes in the frame,

(d) placing the bracket against the door panel with the holes in the bracket aligned with the screw holes in the door frame, and

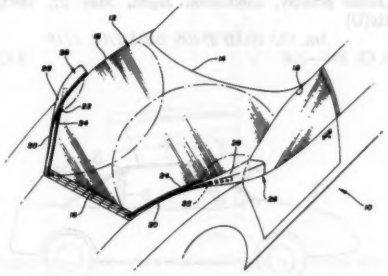
(e) inserting the screws into the door frame through the respective holes in the mounting bracket.

5,009,459

WIPER SYSTEM FOR RAKED WINDSHIELD

Harlan W. Charles, Southfield, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 22, 1990, Ser. No. 497,172
Int. Cl.[5] B60S *1/28*
U.S. Cl. 296—84.1 1 Claim



1. A wiper system in a vehicle of the type having a windshield with a lower edge, an upper edge, and a pair of side edges, each of which side edges is defined partially by a body door pillar line and partially by a hood line, said windshield also having a length measured from said lower to upper edge that is relatively large compared to its width measured between said side edges, a wiper system, comprising,

a pair of wiper arms, each oscillatable about a respective pivot point located at the juncture of a respective door pillar line and hood line and over a wipe pattern having an upper limit parallel to a respective door pillar line and a lower limit parallel to a respective hood line,

a wiper blade mounted to each of said arms of a length sufficient to reach close to both said upper and lower edges as said wiper arms move in said wipe pattern, and,

a pair of slotted side mirror housings, each located over a wiper arm pivot point and extending partially along a respective hood line,

whereby, as said wiper arms oscillate, they move through said slotted wiper housings as substantially the entire surface of said windshield is wiped by said blades, and when said wiper arms are stopped at said lower limit, they are partially covered by said side mirror housings.

5,009,460

WINDOW MOLDING MEMBER FOR AUTOMOBILES

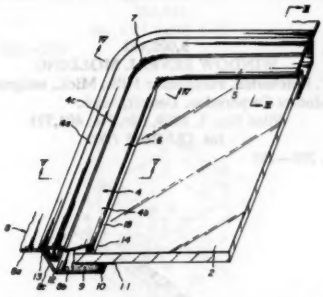
Takao Iwata, and Tetsuo Hotta, both of Yokohama, Japan, assignors to Hashimoto Forming Industry Co., Ltd., Japan

Filed Oct. 26, 1989, Ser. No. 426,779
Claims priority, application Japan, Oct. 31, 1988, 63-142492[U]
Int. Cl.[5] B60J *10/02, 1/20*
U.S. Cl. 296—93 5 Claims

1. A window molding member for automobiles including a body panel having an outer surface, a flange which is recessed from said outer surface, and a shoulder portion connecting said flange with said outer surface, and a window plate mounted on said flange of the body panel, said window plate having a peripheral edge opposing said shoulder portion of the body panel leaving a gap therebetween, said molding member comprising at least one upper segment to extend at least partly along an upper edge of the window plate, at least one side segment to extend along at least one side edge of the window plate, at least one corner segment integrally and continuously connecting said upper and side segments with each other in a longitudinal direction of said molding member,

a main body comprising a sheet material and adapted to cover said gap, said main body including first and second sections which are integrally connected with each other and to be engaged with the outer surfaces of said body panel and said window plate, respectively, said second section having a width which varies in the longitudinal direction of said molding member, and

an elongate cushion element comprising a resilient material integrally connected to said second section of the main body to extend along an entire length of the molding



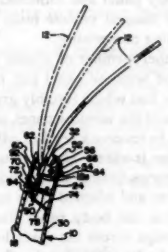
member such that the cushion element contacts said outer surface of the window plate, said cushion element cooperating with said second section of the main body to form a weir along said side segment for preventing water on the window plate from flowing across said side segment and guiding the water to flow along said side segment.

5,009,461

VEHICLE DOOR PIVOTED SIDE GLASS

Garry R. Smith-Horn, Utica, and Robert J. Wendt, Keego Harbor, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed May 31, 1988, Ser. No. 200,225
Int. Cl.[5] B60J *1/14, 5/04*
U.S. Cl. 296—146 5 Claims



1. In an automotive vehicle having body structure defining a door opening, a door assembly which is hingedly connected with said body structure via a hinge means for movement between a closed position in which the door assembly closes said opening and is aligned with said vehicle and an open position in which the door assembly extends transversely of said vehicle to permit entry into and exit from said vehicle, the improvement being that said door assembly includes a window which is pivotally supported by a pivot means for movement about a generally horizontal axis between inner and outer positions, said axis being fixed in position relative to a lower part of said door assembly during said movement, and an operating mechanism including a movable member operatively connected with said window and with said body structure for automatically effecting pivotal movement of said window from its inner position towards its outer position in response to movement of the door assembly from its closed position towards its open position so that said window is disposed out of the way to permit ease of entry into the vehicle when the door

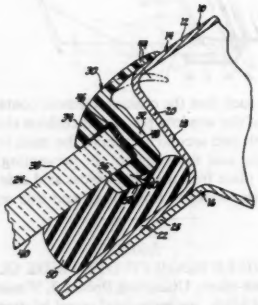
assembly is open and for automatically effecting pivotal movement of said window from its outer position towards its inner position in response to movement of the door assembly from its open position towards its closed position so that the window closes off said opening when the door assembly is closed.

5,009,462

WINDOW REVEAL MOLDING

Ricky V. Katcherian, Farmington Hills, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Sep. 1, 1989, Ser. No. 401,721
Int. Cl.[5] B60J *1/00*
U.S. Cl. 296—201 1 Claim



1. A motor vehicle window molding installation having a molding concealing a space between an inwardly extending wall of a flanged vehicle body panel and an edge of a window panel, with the edge of the window panel overlying a parallel extended wall intersecting the inwardly extending wall of the flanged vehicle body panel and mounted on the parallel extended wall of the flanged vehicle body panel by a curable adhesive, the molding comprising:

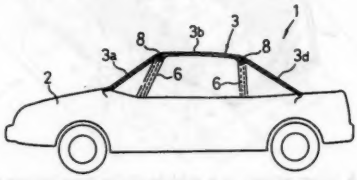
a C-shaped channel member of plastic material fitted onto the edge of the window panel and having spaced apart outer and inner legs which forcibly grip the opposed outer and inner faces of the window panel, said channel member being adapted to receive a bead of adhesive by which the channel member is adhesively mounted onto the window panel, a continuous flexible lip extruded integral with the channel member and adapted upon mounting of the window panel upon the body panel flange by the curable adhesive to bridge across the space between the window panel and the body panel thereby flexing and overlying the body panel and bearing upon the body panel exerting a spring-like influence tending to rotate the molding, and the inner leg having a continuous foot extruded integral therewith, and defined by a crevasse formed in the inner leg underlying the inner face of the window panel and extending angularly away from the intersection of the inwardly extending wall and the parallel extended wall of the body panel flange and towards the inner face of the window panel and terminating within a perimeter of the window panel, wherein the continuous foot is adapted to seat within the curable adhesive so that the adhesive surrounds the foot and enters the crevasse and thereby mechanically retains the lower leg of the molding onto the window panel and the body panel independently of the bead of adhesive within the channel member to thereby further anchor the molding against being dislodged from the vehicle body by the rotary force exerted thereon by the continuous flexible lip.

5,009,463

REINFORCED PLASTIC AUTOMOBILE BODY STRUCTURE

Masahiro Saitoh; Suguru Yoshida; Keiichi Obata, and Yoshinobu Ono, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 200,030, May 27, 1988, abandoned. This application May 1, 1990, Ser. No. 517,381
Claims priority, application Japan, May 27, 1987, 62-80218[U]
Int. Cl.[5] B62D *25/06;* B60J *1/02, 1/18*
U.S. Cl. 296—210 5 Claims



1. An automobile body structure comprising:

a body shell;

a canopy of molded plastic material carried by said body shell including a front windshield section, a top section, and a rear window section integrally formed of undivided, one-piece construction, said canopy having a primary thickness between interior and exterior surfaces thereof that is substantially uniform;

said interior surface of said canopy extending inwardly to form at least one continuous projection of a thickness greater than said primary thickness which extends laterally across said canopy; and

an arch-shaped rigid support member separate from, but embedded in, said projection and being substantially coextensive therewith.

5,009,464

STRUCTURE FOR DRAINING LIQUID FOR A VEHICLE AND METHOD FOR FORMING THE STRUCTURE

Minekazu Hasegawa; Keiichi Ikeda, and Junichi Fujihira, all of Chiba, Japan, assignors to Kinugawa Rubber Industrial Co., Ltd., Chiba, Japan

Continuation of Ser. No. 77,370, Jul. 24, 1987, abandoned. This application Jan. 11, 1990, Ser. No. 463,887
Claims priority, application Japan, Jul. 25, 1986, 61-175092; Aug. 11, 1986, 61-188171; Aug. 12, 1986, 61-189180; Jan. 14, 1987, 62-7149
Int. Cl.[5] B60J *7/11*
U.S. Cl. 296—213 5 Claims

1. A structure for draining fluid from a vehicle, comprising:

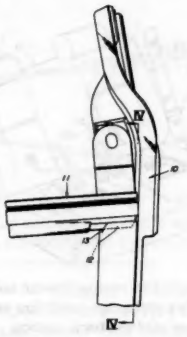
a vehicle roof having a roof opening, said roof opening defined by front, rear and first peripheral side portions of said roof and a top edge of a door glass;

a first weatherstrip disposed along said front, rear and first peripheral side portions of said roof, said first weatherstrip including an intermediate portion having a V-shaped cross-section defining a groove recessed in a sidewall of said first weatherstrip, said sidewall being substantially parallel to a longitudinal axis of said first weatherstrip;

an easily removable roof panel disposed in said roof opening and having front, rear, first and second peripheral sides corresponding to said front, rear and first peripheral side portions and to said top edge of said door glass, respectively;

a second weatherstrip disposed along said second peripheral side of said roof panel, said second weatherstrip including an end portion adjacent said first weatherstrip and having

a wedge-shaped cross-section portion inserted into said groove of said first weatherstrip in a tongue and groove



type connection when said roof panel is inserted into said roof opening.

5,009,465

ROLL-UP ROOF COVERING FOR AUTOMOBILES WITH REMOVABLE ROOF PANELS

Michael L. Induni, 5873 Dogwood La., Johnston, Iowa 50131

Filed Aug. 14, 1987, Ser. No. 85,372
Int. Cl.[5] B60J 7/10
U.S. Cl. 296—219 **4 Claims**

1. A vehicle having a roll-up roof covering with the vehicle body having U-shaped roof openings on opposite sides of a longitudinal center line roof member extending between the windshield and rear of the roof, said body having opposite side windows and said roof on opposite sides adjacent said side windows including front and rear body openings for at times securing roof panels in place, and at other times for securing a roll up roof covering, said roll-up roof covering comprising:

a cover sheet of flexible material having opposite ends extending over said vehicle covering said U-shaped roof openings,

a locking assembly on opposite ends of said cover sheet engaging said front and rear body openings to secure said cover sheet in a covering position over said U-shaped roof openings, and

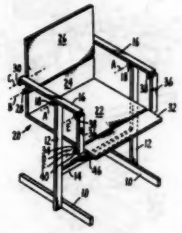
each of said locking assemblies including a pair of opposed rod means having outer ends respectively received in said front and rear openings in the vehicle body, and one of said rod means being longitudinally moveable relative to the other rod means for engagement and disengagement with the associated body opening.

5,009,466

RECLINING CHAIR

Charles O. Perry, 20 Shorehaven Rd., East Norwalk, Conn. 06855

PCT No. PCT/US89/01704, § 371 Date May 2, 1989, § 102(e) Date May 2, 1989
Continuation-in-part of Ser. No. 185,707, Apr. 25, 1988, abandoned. This PCT application Apr. 24, 1989, Ser. No. 381,151
Int. Cl.[5] A47C 1/02
U.S. Cl. 297—323 **3 Claims**



1. A reclining chair comprising

a seat having a front and a back, a support plane adapted to support a user and a seat back portion extending approximately six inches above the support plane generally perpendicular thereto,

a frame for supporting the chair on a floor,

an arm pivotally supported on the frame above the seat and pivotally coupled to the front and back of the seat to suspend the seat from the frame for reclining,

a back panel adapted to engage the user's back and forming a first control lever which comprises the coupling between the arm and the back of the seat with the first lever pivoted near its lower end to the seat back portion approximately six inches above the support plane and pivoted to the arm intermediate of its ends for moving the seat horizontally with respect to the arm and supporting the user's low-back responsive to pressure on the first lever by the user's back, and

a thigh support adapted to engage the user's upper legs and forming a second control lever which comprises the coupling between the arm and the front of the seat with the second lever pivoted near one end to the seat and pivotally coupled intermediate to its ends to the arm for moving the seat vertically with respect to the arm responsive to pressure on the second lever by the user's legs,

the coupling between the arm and the seat including at least four pivot axes.

5,009,467

ADJUSTABLE ARMREST FOR CHAIR

David C. McCoy, 1903 Brooks La., Oviedo, Fla. 32765

Filed May 30, 1989, Ser. No. 358,814
Int. Cl.[5] A47C 7/54
U.S. Cl. 297—411 **6 Claims**

1. An adjustable armrest attachment for providing elbow support to a secretarial chair, or the like, said chair having a generally horizontal seat supported in elevated position on a base and a generally vertical backrest supported above said seat, said attachment comprising:

left and right, oppositely laterally extending bracket members having inner and outer ends;

means attaching said inner ends of said bracket member in adjacent positions at a point of attachment to said chair;

left and right elbow rests;

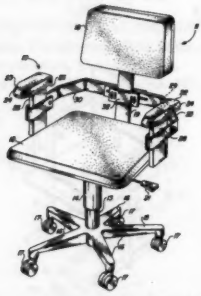
means respectively attaching said elbow rests to said outer ends in opposing, left and right, laterally spaced positions elevated above said seat;

means located at said inner end point of attachment for

moving said inner ends laterally, opposite to each other and relative to said point of attachment, for selectively varying the lateral spacing of said elbow rests;

means releasably locking said inner ends against said opposite lateral movement; and

means located at said outer ends for selectively varying the elevation of said elbow rests relative to said seat;



wherein said means for varying the lateral spacing further comprises said inner ends being placed in superposed relationship at said point of attachment and each having a laterally extending elongated slot, and said means attaching said inner ends to said chair comprises fastening means extending through said slots.

5,009,468

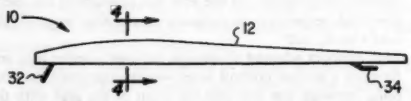
RESILIENT ARM REST

K. A. Fomby, P.O. Box 636, Gainesville, Tex. 76240

Filed Aug. 29, 1986, Ser. No. 902,474

Int. Cl.[5] A47C *7/54*

U.S. Cl. 297—412 **9 Claims**



1. An arm rest cap comprising:

a lower rigid base member for securing said cap to a passenger seat;

an upper resilient member positionable over said base;

a pair of angled strips having a vertical portion and horizontal portion wherein said vertical portion and the upper surface of said horizontal portion are embedded within said upper resilient member and the lower surface of said horizontal portion engages said lower rigid base member.

5,009,469

VEHICLE SEAT WITH SEATBELT BUCKLER RECEIVER

Takayuki Mouri, Kanagawa, Japan, assignor to Ikeda Bussan Co., Ltd., Ayase, Japan

Continuation of Ser. No. 345,183, May 1, 1989, abandoned. This application Mar. 22, 1990, Ser. No. 499,208

Claims priority, application Japan, Sep. 21, 1988, 63-123886[U]

Int. Cl.[5] B60R *21/00*

U.S. Cl. 297—468 **11 Claims**

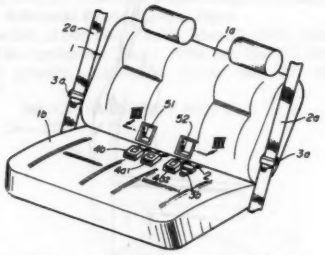
1. A vehicle seat comprising:

at least two seatbelt assemblies each including a belt, a tongue member and a buckle member;

a seat portion;

a seatback portion including a front surface having a recess therein;

one receptacle member for each seatbelt assembly tightly received in said recess and having an opening which faces forward, said receptacle member having a depth which is substantially twice the thickness of each buckle member



and being adapted to receive therein said buckle members in a vertically overlapped condition and parallel to said front surface of said seatback portion.

5,009,470

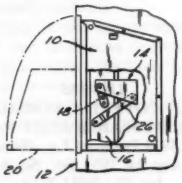
LATERAL FILE DRAWER POSITIONLOCK

Timothy J. Roller, Ashville, N.Y., and Robert E. Thiele, Wexford, Pa., assignors to Adanlock, Jamestown, N.Y.

Filed May 22, 1989, Ser. No. 354,742

Int. Cl.[5] A47B *88/00*

U.S. Cl. 312—325 **2 Claims**



1. A mounting for a front opening drawer rotatable from a closed position to an open position comprising:

a cabinet side;

a drawer mounting saddle rotatably connected to a first linkage arm and a second linkage arm; said first linkage arm and said second linkage arm rotatably mounted to said cabinet side such that the first linkage arm and the second linkage arm are in continuous non-parallel orientation during rotation from the open position to the closed position, and said first linkage arm and said second linkage arms intersect in the closed position;

an engagement member on the first linkage arm; and

a reception aperture on the second linkage arm to receive the engagement member when the drawer is in the closed position.

5,009,471

IMPROVED KALEIDOSCOPE STRUCTURE

Vincent K. W. Lee, No. 44, Lane 458, Sheh Chung St., Taipei, Taiwan

Filed Dec. 21, 1989, Ser. No. 454,689

Int. Cl.[5] G02B *23/00*

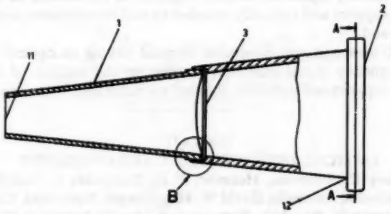
U.S. Cl. 350—4.1 **9 Claims**

1. A structure for a kaleidoscope, comprising:

a hollow tubular housing having a viewing end and an end opposite said viewing end;

a disk-shaped pattern creating device for producing changing patterns at least in the center portion thereof, said pattern creating device located at said opposite end of said housing; and

a multi-angled prism positioned between said viewing end and said pattern creating device;



thereby creating, at said viewing end, a multi-imaged view of the patterns created by said pattern creating device.

5,009,472

LIGHT SCANNING DEVICE WITH POLARIZING DEVICE TO MAKE LIGHT TRANSMISSION MORE UNIFORM

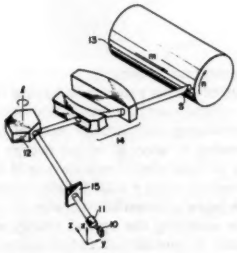
Akira Morimoto, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 31, 1987, Ser. No. 140,166

Claims priority, application Japan, Jan. 8, 1987, 62-1100; Jan. 16, 1987, 62-4583

Int. Cl.[5] G02B *26/10, 26/02*

U.S. Cl. 350—6.5 **25 Claims**



1. A light scanning device comprising:

a light source equipped with a semiconductor laser;

deflecting means for deflecting a light beam emitted by said light source, said light beam being deflected in a scanning direction within a plane which is perpendicular to the plane of the P-N junction of said semi-conductor laser;

a scanning lens for imaging a light beam deflected by said deflecting means on a subject to be scanned; and

a polarizing device for changing the polarized state of said light beam to include polarized light which contains at least a p-polarized component with respect to an incident plane including an optical axis of the scanning lens and an incident direction of the light beam, said light beam passing through said polarization device only once.

5,009,473

LOW VIBRATION RESONANT SCANNING UNIT FOR MINIATURE OPTICAL DISPLAY APPARATUS

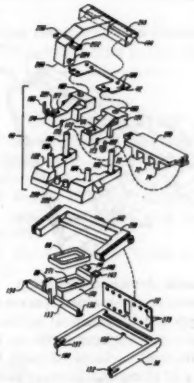
Gregory H. Hunter, Westwood; Benjamin A. Wells, Newton, and Michael A. Feldstein, Sudbury, all of Mass., assignors to Reflection Technology, Inc., Waltham, Mass.

Continuation-in-part of Ser. No. 200,645, May 31, 1988, Pat. No. 4,902,083. This application Nov. 13, 1989, Ser. No. 434,351

Int. Cl.[5] G02B *26/10*

U.S. Cl. 350—6.6 **24 Claims**

1. In a resonant electromechanical scanning unit having a base, a mirror, a mirror frame attached to said mirror, a first spring connecting said mirror frame to said base to allow said mirror and said mirror frame to oscillate relative to said base, a counterbalance mass, a second spring connecting said counterbalance mass to said base to allow said counterbalance mass to oscillate relative to said base and a drive motor for causing said mirror and said counterbalance mass to oscillate, the improvement wherein at least a portion of said mirror frame and said base are comprised of a moldable material and are fabricated by a molding process and said first spring is inserted into said base and into said portion of said mirror frame during said molding process to form an integral mirror mount unit.



5,009,474

PROTECTION DEVICE FOR A FIBER LIGHT CONDUCTOR JUNCTION

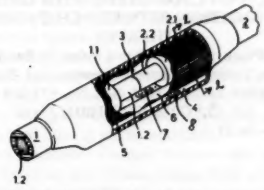
Ulrich Wurmser, Rottach-Egern, and Josef Meyer, Grosshelfendorf, both of Fed. Rep. of Germany, assignors to Messerschmitt-Boelkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Filed Nov. 8, 1989, Ser. No. 434,407

Claims priority, application Fed. Rep. of Germany, Nov. 10, 1988, 3838075

Int. Cl.[5] G02B *6/38*

U.S. Cl. 350—96.2 **5 Claims**



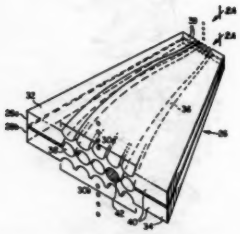
1. A protection device for a junction between two ends of fiber light conductors facing each other, comprising a protection jacket on each of said fiber light conductors, a sleeve envelope (4) of shrinkable material bridging said junction, a shrink fit between each end of said sleeve envelope and the respective protection jacket for securing said sleeve envelope to said protection jackets through said shrink fits, a fiber material filling in said sleeve envelope, said fiber material filling comprising uninterrupted tension resistant filler fibers bridging said junction inside said sleeve envelope, said filler fibers having such a length that each fiber end reaches into a respective shrink fit where said fiber ends are compressed directly between said sleeve envelope and said protection jacket by said shrink fit of said sleeve envelope on said protection jacket for transmitting tension loads substantially only through said tension resistant filler fibers.

5,009,475

IMAGE TRANSFER DEVICE AND METHOD OF MANUFACTURE

Steven B. Knudson, Golden, Colo., assignor to Advance Display Technologies, Inc., Golden, Colo.

Filed Dec. 27, 1989, Ser. No. 457,269
Int. Cl.[5] G02B 6/00
U.S. Cl. 350—96.10 8 Claims



1. An image transfer device, comprising:

at least first and second pre-molded spacers each having first and second opposed longitudinal surfaces and first and second opposed end surfaces, with at least one of the opposed longitudinal surfaces of each spacer provided with a plurality of elongated grooves etched therein with the grooves being in substantially abutting relation along the first end surface and laterally displaced from one another and terminating along the second end surface, and wherein the second end surface of each spacer has a predetermined thickness greater than the thickness of the first end surface;

means for interconnecting the first and second spacers in back-to-back confronting relationship such that the etched grooves of the first and second spacers cooperate to form a set of closed channels through the interconnected first and second pre-molded spacers; and

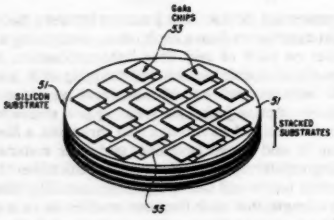
means located within each of the closed channels for conducting elemental image portions of an image through the closed channels between the first and second end surfaces, wherein the means for conducting includes a conducting material along an inner peripheral surface of each of the closed channels.

5,009,476

SEMICONDUCTOR LAYER WITH OPTICAL COMMUNICATION BETWEEN CHIPS DISPOSED THEREIN

Lee R. Reid, Plano, and Han-Tzong Yuan, Dallas, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jan. 16, 1984, Ser. No. 571,044
Int. Cl.[5] G02B 6/12; H01L 31/12
U.S. Cl. 350—96.11 33 Claims



1. An optical communication system which comprises:

(a) support means of semiconductor material having a surface;

(b) optical frequency signal transmission means disposed within and forming a part of said support means and extending to said surface;

(c) a first semiconductor element having an optical frequency signal transmitter disposed at the surface of said support and optically coupled to said transmission means; and

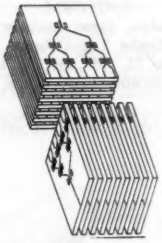
(d) a second semiconductor element having an optical frequency signal receiver disposed at the surface of said support and optically coupled to said transmission means.

5,009,477

OPTICAL INTERCONNECT ARRANGEMENT

Rodney C. Alferness, Holmdel, N.J.; Zigmantas L. Budrikis, Dalkeith, Australia; David W. Hagelbarger, Nederland, Colo.; Herwig W. Kogelnik, Rumson, and Arun N. Netravali, Westfield, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed May 12, 1989, Ser. No. 350,962
Int. Cl.[5] G02B 6/28, 6/26
U.S. Cl. 350—96.15 19 Claims



1. An arrangement comprising:

An M plurality of output plates each having N output ports delivering optical energy substantially along a line, said output plates being substantially parallel to each other, thereby forming an array of output energy ports;

an N plurality of input plates, each having M input ports for receiving optical energy substantially along a line, said input plates being substantially parallel to each other;

and means for coupling the optical energy of output j of plate i in said M plurality of output plates to input i of input plate j in said N plurality of input plates, where i is an integer in the range 1 to M and j is an integer in the range 1 to N.

5,009,478

METHOD FOR THE MANUFACTURE OF AN OPTICAL FIBER COUPLER

Hiroyuki Sasaki, Hachiouji; Masato Shimamura, Sagamihara; Juichi Noda, Mito; Hiroaki Hanafusa, Mito, and Yoshiaki Takeuchi, Mito, all of Japan, assignors to Japan Aviation Electronics Industry Limited and Nippon Telegraph and Telephone Corporation, both of Tokyo, Japan

Filed Nov. 7, 1989, Ser. No. 432,935
Claims priority, application Japan, Nov. 18, 1988, 63-292139
Int. Cl.[5] G02B 6/26; C03B 23/20
U.S. Cl. 350—96.15 5 Claims

1. A method for the manufacture of an optical fiber coupler by fusion welding at least two optical fibers, comprising the steps of:

fusion welding at least two optical fibers to form coupled optical fibers;

heat elongating said coupled optical fibers;

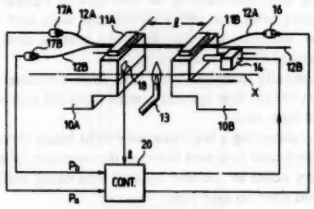
measuring a performance of said coupled optical fibers at a desired elongation length;

repeating said heat elongating step and said measuring step at least twice for different elongation lengths;

determining a functional equation representing a relationship between said elongation length and said performance of

said coupled optical fibers, through approximate calculation based on measured values of the performance;

calculating from said functional equation an elongation



length which provides an intended performance of said coupled optical fibers; and

heat elongating said coupled optical fibers to said calculated elongation length to obtain said optical fiber coupler.

5,009,479

OPTICAL FIBER COUPLING DEVICE AND METHOD FOR ITS USE

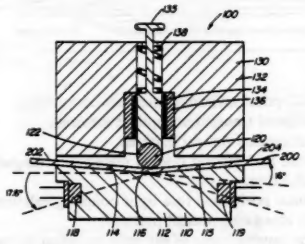
Shawn J. Morrison, Saskatoon, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Oct. 5, 1989, Ser. No. 417,624

Claims priority, application Canada, Sep. 27, 1989, 613,580

Int. Cl.[5] G02B 6/26; H01J 5/16

U.S. Cl. 350—96.15 **13 Claims**



1. An optical coupler, comprising:

a rigid coupling element having a concave surface defining a desired bend profile for an optical fiber, the coupling element comprising a rigid body having the concave surface and an optoelectronic device carried by the rigid body at a position and orientation for optical coupling between the optoelectronic device and an optical fiber held against the concave surface so as to conform to the desired bend profile;

a resiliently deformable bending element having a convex surface which is complementary to the concave surface of the coupling element; and

means for urging the bending element toward the coupling element so as to conform an optical fiber placed between the concave surface of the coupling element and the convex surface of the bending element to the desired bend profile

13. A method for coupling an optical signal between an optical fiber and an optoelectronic device, the method comprising:

providing a rigid coupling element having a concave surface defining a desired bend profile for an optical fiber, the coupling element comprising a rigid body which includes the concave surface and an optoelectronic device which is carried by the rigid body at a position and orientation for optical coupling between the optoelectronic device and the fiber conforming to the desired bend profile against the concave surface;

providing a resiliently deformable bending element having a convex surface which is complementary to the concave surface of the coupling element;

placing an optical fiber between the convex surface of the bending element and the concave surface of the coupling element; and

urging the bending element toward the coupling element so as to conform the optical fiber to the desired bend profile.

5,009,480

FIBER OPTIC GYRO

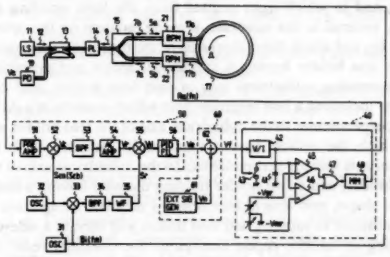
Kenichi Okada; Masashi Nishino, and Shu Tanigawa, all of Tokyo, Japan, assignors to Japan Aviation Electronics Industry Limited, Tokyo, Japan

Filed Aug. 3, 1990, Ser. No. 562,605

Claims priority, application Japan, Aug. 11, 1989, 1-208860; Oct. 13, 1989, 1-267582

Int. Cl.[5] G02B 6/26; G01B 9/02

U.S. Cl. 350—96.15 **7 Claims**



1. A fiber optic gyro comprising:

a light source;

an optical fiber coil;

an optical coupler whereby light from said light source is split into two for input into said optical fiber coil at one end and at the other end thereof, respectively, and two rays of light having propagated through said optical fiber coil in opposite directions and output therefrom are caused to interfere with each other;

a photodetector for detecting said interference light available from said optical coupler;

a biasing phase modulator disposed between said optical coupler and one end of said optical fiber coil;

a biasing voltage generator for generating a phase modulating biasing voltage of a predetermined frequency which is applied to said biasing phase modulator;

a ramp phase modulator disposed between said optical coupler and the other end of said optical fiber coil;

a ramp voltage generator for generating a phase modulating ramp voltage which is applied to said ramp phase modulator;

a phase difference detect/control section whereby a phase difference between said two rays of light interfering with each other in said optical coupler is detected from the output of said photodetector and said ramp voltage generator is controlled by said detected output so that said phase difference may be of a predetermined value;

external signal generating means for generating a varying external signal; and

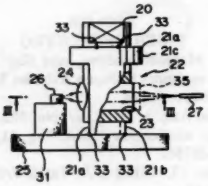
external signal adding means whereby external signal is added to the output of said phase difference detect/control section and said added output is applied to said ramp voltage generator to thereby fluctuate the frequency of said ramp voltage.

5,009,481

OPTICAL MODULE AND METHOD OF MANUFACTURING SAME

Kitoshi Kinoshita, Inagi, and Hiroatsu Aoki, Kawasaki, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Aug. 23, 1989, Ser. No. 398,825
Claims priority, application Japan, Aug. 23, 1988, 63-207391; Aug. 11, 1989, 1-207005
Int. Cl.[5] G02B 6/32
U.S. Cl. 350—96.18 17 Claims



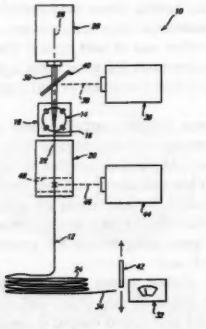
1. An optical module having a substrate, an optical lens defining an optical axis, a light emitting element and an optical fiber, and in which light emitted from the light emitting element, secured to the substrate, is made incident on the optical fiber by, and along the optical axis of the optical lens, comprising a lens holder having a cylindrical shape and defining a corresponding cylindrical axis of said lens holder, said lens holder including a lens insertion hole which extends in a direction perpendicular to the cylindrical axis of the lens holder, and in which the optical lens is immovably mounted with the optical axis thereof perpendicular to the cylindrical axis of the lens holder, and a lens holder holding member having a cylindrical shape, said lens holder holding member being fixed to the substrate to support said lens holder and having a sidewall defining an interior recess configured for coaxially receiving the lens holder therein and for exposing the optical lens in the direction along the optical axis thereof, said interior recess corresponding to and telescopingly receiving therein the lens holder.

5,009,482

METHOD AND APPARATUS FOR FABRICATING A PIGTAILED LENS ASSEMBLY

Thomas C. Lincoln, South Pasadena, Calif., assignor to Microdot Inc., Chicago, Ill.

Filed Sep. 25, 1989, Ser. No. 411,919
Int. Cl.[5] G02B 6/32
U.S. Cl. 350—96.18 12 Claims



1. An apparatus for joining an optical fiber to a spherical lens comprising

means for retaining said spherical lens so as to allow a light beam to pass through said lens along a first axis thereof;

means for directing a low intensity light beam through said lens along said first axis thereof;

means for micropositioning an end of said optical fiber in contiguity with said lens and colinear with said first axis thereof, whereby said low intensity beam is directed into said optical fiber by said lens;

means optically coupled with said fiber for detecting the amount of said low intensity beam directed into said fiber by said lens; and

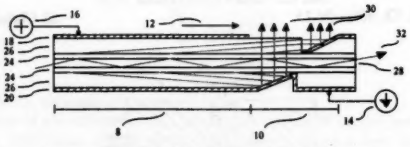
means for directing a high intensity light beam through said lens along said first axis thereof, the intensity of said high intensity beam as focused by said lens being sufficient to fuse said fiber to said lens.

5,009,483

OPTICAL WAVEGUIDE DISPLAY SYSTEM

Marshall A. Rockwell, III, 303 Grenola St., Pacific Palisades, Calif. 90272

Continuation-in-part of Ser. No. 337,141, Apr. 12, 1989. This application Jul. 25, 1989, Ser. No. 385,910
Int. Cl.[5] G02B 6/04
U.S. Cl. 350—96.24 23 Claims



1. A visual optical switching element comprising:

a first elongated transparent optical material,

a second elongated optical material,

said first and said second optical materials arranged alongside each other,

a light source positioned in a light coupling relationship to said first elongated optical material,

a means for causing some of the light traveling through said first optical material from said light source to exit selectively into said second optical material so light can be observed by a viewer,

a means of altering the path taken by light traveling through said second optical material,

said path altering means consisting of a plurality of abrupt discontinuities formed in said second optical material.

5,009,484

DIFFRACTION GRATINGS HAVING HIGH EFFICIENCIES

Hendrik J. Gerritsen, Providence, R.I., assignor to Advanced Environmental Research Group, Woolwich, Me.

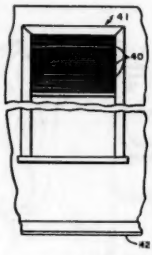
Filed May 3, 1989, Ser. No. 346,726
Int. Cl.[5] G02B 5/18
U.S. Cl. 350—162.11 16 Claims

1. A diffraction grating structure comprising

a substrate having a grating portion at an input surface thereof and an adjacent solid portion at an output surface thereof;

a plurality of diffracting elements formed in said grating portion, each of said diffracting elements including grooves having a selected depth which depends on a selected design wavelength λ of incoming radiation im-

pinging thereon, the diffracting elements being formed at a selected slant angle ϕ with reference to a direction



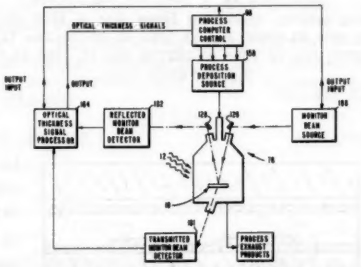
orthogonal to the plane of the input surface of said grating portion.

5,009,485

MULTIPLE-NOTCH RUGATE FILTERS AND A CONTROLLED METHOD OF MANUFACTURE THEREOF

James T. Hall, Torrance, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Aug. 17, 1989, Ser. No. 394,909
Int. Cl.[5] G02B *27/00*; B05D *5/12*; C23C *14/54*
U.S. Cl. 350—163 **9 Claims**



1. A method for forming a multiple-notch rugate filter comprising a substrate having formed thereon a layer of an optical material having a refractive index that varies according to a continuous predetermined pattern as a function of the thickness of said layer, comprising the steps of:

(a) providing said substrate;

(b) providing rectants which interact physically or chemically to form said optical material as a layer on said substrate;

(c) providing an ideal target profile of refractive index versus thickness of said layer, said profile having a multiple-notch composite pattern formed from superpositioned single-notch patterns, and determining from said target profile ideal values of optical thickness at successive points in time corresponding to points along said profile;

(d) providing target process conditions as a function of time for said reactants operative to form said layer having said ideal target profile;

(e) initiating said process conditions to form a layer having a depositing profile;

(f) performing continuous optical monitoring of said layer as deposited to provide an optical signal;

(g) determining from said optical signal the measured increments of optical thickness of said layer as deposited and continuously monitoring said increments of optical thickness;

(h) determining whether said optical thickness value is measured at the predetermined time relative to said target process conditions that produce said ideal target profile;

(i) based on the results of (h), determining the multiple sinusoidal phase-angle adjustments required to be made to the depositing profile of refractive index versus thickness of said layer in order to follow accurately said ideal target profile, wherein said determining comprises applying the following equation:

$$n(z;\phi_i) = \bar{n}^* - \frac{1}{\bar{n}} \sum_{i=1}^{m} \Delta n_i^* \sin\left(\frac{4\pi \bar{n}^* z^*}{\lambda_i} + \phi_i\right)$$

where

n = refractive index of optical material

$\bar{n}$ = average index of refraction over one period in film thickness space (z)

m = total number of rugate transmittance notches

z = design position of layer

i = component integer

Δn_i = i^{th} peak-to-trough index modulation

λ_i = i^{th} notch wavelength

ϕ_i = i^{th} sinusoidal phase angle adjustment, continually updated by algorithm to insure Bragg reflection at λ_i

* = parameters that can have local errors, which are compensated for by ϕ_i

(j) altering said process conditions over time to provide said adjustments to said actual profile;

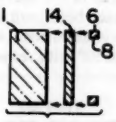
(k) repeating steps "f" through "j" the number of times required to form said multiple-notch rugate filter.

5,009,486

FORM DEPICTING, OPTICAL INTERFERENCE AUTHENTICATING DEVICE

Jerzy A. Dobrowolski, Ottawa; Fang C. Ho, Gloucester, and Allan J. Waldorf, Kemptville, all of Canada, assignors to Canadian Patents and Development Limited/Societe Canadienne des Brevets et D'Exploitation Limitee, Ottawa, Canada

Continuation-in-part of Ser. No. 741,562, Jun. 5, 1985. This application Mar. 23, 1989, Ser. No. 327,542
Claims priority, application Canada, Jun. 8, 1984, 456146
Int. Cl.[5] G02B *1/10, 27/00*; B42D *15/00*
U.S. Cl. 350—164 **13 Claims**



1. An authenticating device for a document for confirming the authentication of the document, comprising:

(a) a substrate attachable to or forming part of the document;

(b) at least one form depicting coating carried on a first side of the substrate, said depicting coating having at least one, at least partially translucent, optical interference layer with the material and thickness thereof such as to provide first particular and known spectral reflectance and spectral transmission characteristics to the form depicting coating, said depicting coating being in a predetermined planar configuration such as to provide a design form to said depicting coating;

(c) at least one contrast coating carried on said first side of the substrate and in interfacial contact with the depicting coating, said contrast coating where coextensive with the depicting coating having at least one, at least partially translucent, optical interference layer with the material and thickness thereof such as to provide second particular and known spectral reflectance and spectral transmission characteristics to the contrast coating, said contrast coat-

ing having a planar area greater than the planar area of the depicting coating so that only a portion of the contrast coating is in interfacial contact with the depicting coating; and

wherein the difference in the said first and second characteristics is sufficient that when the coatings are viewed from a particular angle, the design form of the depicting coating is visible by light reflected or transmitted at lest in part by optical interference at said interfacial contact of the coatings as a different color from hat of the contrast coating which is not in interfacial contact with the depicting coating.

5,009,487

PRISM SYSTEM FOR A STEREOSCOPIC MICROSCOPE

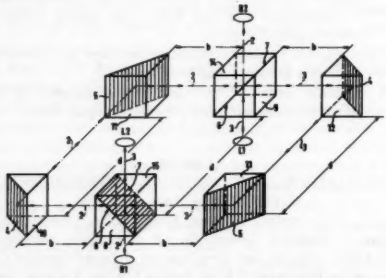
Josef Reiner, Cologne, Fed. Rep. of Germany, assignor to Oculus Optikgeraete GmbH, Wetzlar, Fed. Rep. of Germany

Filed Jul. 28, 1989, Ser. No. 386,735

Claims priority, application Fed. Rep. of Germany, Jul. 30, 1988, 3826069

Int. Cl.[5] G02B *5/04, 21/22*

U.S. Cl. 350—286 **13 Claims**



1. In a prism system for a stereoscopic microscope having a plurality of reflecting surfaces each deflecting one of a right and left beam path by 90°, the improvement comprising wherein four of said reflecting surfaces are provided in each beam path, wherein two of said surfaces in each beam path are reflection surfaces arranged in planes parallel with respect to an optic longitudinal axis of the microscope, and wherein the two other surfaces in each beam path are respectively inlet and outlet surfaces and are inclined at 45° with respect to the optic longitudinal axis and at 90° with respect to one another.

5,009,488

FILTER ACCESSORY FOR AN IMAGING MICROSPECTROFLUORIMETER

Fredric S. Fay; Kevin E. Fogarty, both of Worcester, and Cyril Rodgers, Paxton, all of Mass., assignors to University of Massachusetts Medical Center, Worcester, Mass.

Continuation of Ser. No. 365,320, Jun. 13, 1989, Pat. No. 4,943,142, which is a continuation of Ser. No. 204,931, May 31, 1988, Pat. No. 4,859,063, which is a continuation of Ser. No. 34,777, Apr. 3, 1987, abandoned, which is a continuation-in-part of Ser. No. 900,407, Aug. 26, 1986, Pat. No. 4,744,677, which is a continuation-in-part of Ser. No. 828,766, Feb. 11, 1986, abandoned. This application Jun. 14, 1990, Ser. No. 538,116

The portion of the term of this patent subsequent to May 17, 2005, has been disclaimed.

Int. Cl.[5] G02B *5/20*

U.S. Cl. 350—315 **7 Claims**

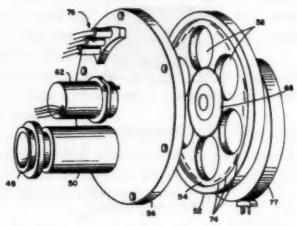
1. A filter accessory comprising:

an optical conduit between a light inlet and a light outlet;

an inlet connector at the inlet end of the optical conduit for coupling the conduit into a microscope system;

an outlet connector complementary to the inlet connector at the outlet end of the optical conduit for coupling the conduit into a microscope system;

a filter assembly eccentrically mounted relative to the optical conduit, the assembly including a filter housing and a



filter disc within the filter housing, the filter disc having a plurality of removable filter elements circumferentially spaced about a filter axis offset from the optical conduit; and

a filter drive for rotating the filter discs about the filter axis.

5,009,489

LIQUID CRYSTAL DEVICE

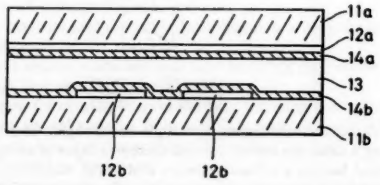
Ken Eguchi; Haruki Kawada; Kunihiro Sakai; Yoshinori Tomida; Hiroshi Matsuda; Akira Tsuboyama; Kiyoshi Takimoto, and Osamu Takamatsu, all c/o Canon Kabushiki Kaisha: 30-2, 3-chome, Shimomaruko, Ohta-ku, Tokyo, Japan

Continuation of Ser. No. 33,191, Apr. 2, 1987, abandoned. This application Jul. 7, 1989, Ser. No. 376,940

Claims priority, application Japan, Apr. 4, 1986, 61-76704; Apr. 8, 1986, 61-80808; Jun. 11, 1986, 61-133776; Jun. 11, 1986, 61-133777; Jun. 11, 1986, 61-133778; Jun. 11, 1986, 61-133779

Int. Cl.[5] G02F *1/13*

U.S. Cl. 350—341 **11 Claims**



1. A ferroelectric liquid crystal device comprising a pair of substrates, a ferroelectric liquid crystal arranged therebetween and an alignment-controlling film arranged on tehliquid crystal side surface of at least one of hte substates, said alignment-controlling film being a polyimide monomolecular film or a monomolecular-built-up film thereof obtained by dehydrating ring closure of a monomolecular or monomolecular-built-up film of a polyamic acid.

5,009,490

PHOTO-CONDUCTIVE LIQUID CRYSTAL LIGHT VALVE

Tomomitsu Kouno; Hideki Hatano; Takashi Yamaji; Sakashi Ootaki, and Masami Nishida, all of Saitama, Japan, assignors to Pioneer Electronic Corp., Tokyo, Japan

Filed Jun. 9, 1989, Ser. No. 363,825

Claims priority, application Japan, Nov. 11, 1988, 63-284970

Int. Cl.[5] G02F *1/13; G04B 19/30*

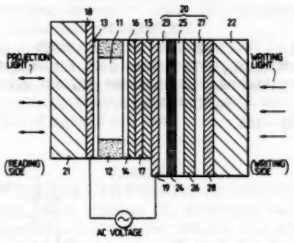
U.S. Cl. 350—342 **2 Claims**

1. A photo-conductive liquid crystal light valve comprising:

a lamination of a photo-conductive layer and a liquid crystal layer;

a pair of transparent electrodes, one electrode of said pair of electrodes being disposed on the outside of said photoconductive layer and another electrode of said pair of electrodes being disposed on the outside of said liquid crystal layer respectively; and

an electroluminescence element disposed on the outside of



one of said electrodes of said pair of electrodes, said one electrode being on a writing side, said electroluminescence element includes a first transparent insulation layer, a transparent electrode, a second transparent insulation layer, a zinc sulfide layer, a third transparent insulation layer, and a metal electrode which are laminated in the stated order.

5,009,491

COMPACT ZOOM LENS SYSTEM

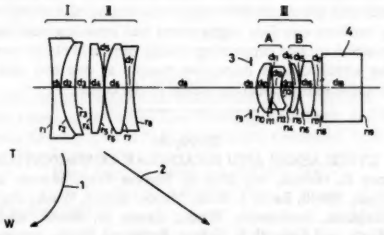
Kazuyoshi Hata, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Aug. 8, 1988, Ser. No. 230,173

Claims priority, application Japan, Aug. 7, 1987, 62-198369; Aug. 17, 1987, 62-204933; Aug. 17, 1987, 62-204934; Aug. 22, 1987, 62-208508

Int. Cl.[5] G02B *15/14*

U.S. Cl. 350—427 **29 Claims**



1. A compact zoom lens system comprising from the object side to the image side:

a first lens unit of a negative refractive power having a cemented lens component consisting of a negative lens element and a positive lens element cemented with each other, said first lens unit being shiftable along an optical axis of the lens system in a zooming operation;

a second lens unit of a positive refractive power having two positive lens components, at least one of which consists of a positive lens element and a negative lens element cemented with each other, said second lens unit being shiftable along the optical axis of the lens system in the zooming operation; and

a third lens unit of a positive refractive power having, from the object side, a front lens component of a negative refractive power and a rear lens component of a positive refractive power, said third lens unit being stationary along the optical axis of the lens system in the zooming operation.

5,009,492

ZOOM LENS

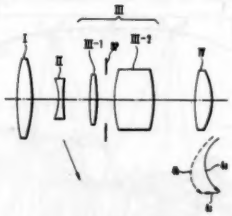
Hiroyuki Hamano, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 1, 1989, Ser. No. 387,826

Claims priority, application Japan, Aug. 10, 1988, 63-199581; Aug. 10, 1988, 63-199582

Int. Cl.[5] G02B *15/14*

U.S. Cl. 350—427 **9 Claims**



1. A zoom lens, when counted from the object side, comprising:

a first lens group having a positive refractive power;

a second lens group having a negative refractive power;

a third lens group having a positive refractive power; and

a fourth lens group having a positive refractive power, wherein

said third lens group includes a front lens unit having a positive refractive power, an aperture stop and a rear lens unit, whereby variation of magnification is performed by moving said second lens group and said fourth lens group, and focusing is performed by moving said fourth lens group, said zoom lens satisfying the following conditional expressions, wherein focal lengths of said second, third, fourth lens groups and said front lens unit respectively are f2, f3, f4, and f3-1, the focal length of the entire lens system at the wide-angle end is fv, the zoom ratio is z, and the imaging magnification at a telephoto end of said second lens group is $\beta 2T$:

$$0.9 < |f2/f\omega| < 1.3$$

$$0.9 < |\beta 2T/\sqrt{z}| < 1.4$$

$$1.8 < f4/f\omega < 2.4$$

$$2.8 < f3/f\omega < 3.7$$

$$1.6 < f3 - 1/f3 < 2.6$$

5,009,493

MIRROR ARRANGEMENT FOR A BEAM PATH IN A MULTIPLE-REFLECTION MEASURING CELL

Edmund Koch, and Dieter Pruss, both of Lübeck, Fed. Rep. of Germany, assignors to Dräger werk Aktiengesellschaft, Lü beck, Fed. Rep. of Germany

Filed Aug. 30, 1989, Ser. No. 400,698

Claims priority, application Fed. Rep. of Germany, Sep. 10, 1988, 3830906

Int. Cl.[5] G02B *5/08*; G01N *21/00*

U.S. Cl. 350—619 **3 Claims**

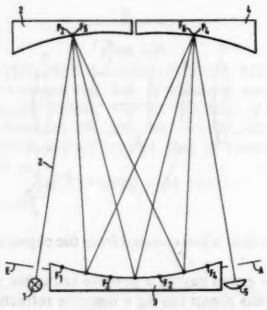
1. A mirror arrangement for defining a beam path in a multiple-reflection cell for measuring the absorption of light in a measuring gas, the cell having an entrance aperture and an exit aperture separated from each other by a predetermined distance, the mirror arrangement comprising:

an entrance aperture mirror and an exit aperture mirror

having respective reflective surfaces approximating respective ellipsoids;

said entrance aperture mirror defining first and second focal points (F_1, F_2) and said exit aperture mirror defining third and fourth focal points (F_3, F_4);

a field mirror disposed opposite of and at a confocal distance from each of said aperture mirrors so as to define a beam path for a beam which permits said entrance aperture to be imaged into said exit aperture via said aperture mirrors and said field mirror;



said entrance aperture and said exit aperture being disposed at opposite ends of said field mirror;

said first and second focal points (F_1, F_2) being separated by a first focal point spacing (F_1- F_2) and said third and fourth focal points (F_3, F_4) being separated by a second focal point spacing (F_3- F_4); and,

said first and second focal point spacings (F_1- F_2 and F_3- F_4) having a sum which is approximately equal to said predetermined distance.

5,009,494

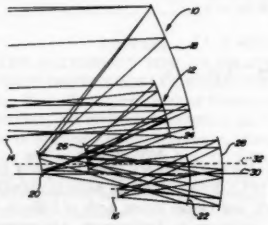
WIDE FIELD ALL-REFLECTIVE MULTIPLE FIELD OF VIEW TELESCOPE

Daryl R. Iossi, Torrance; Lacy G. Cook, El Segundo, and Alfred Koppensteiner, Torrance, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed May 21, 1990, Ser. No. 525,801

Int. Cl.[5] G02B *17/06, 7/18, 26/10, 15/00*

U.S. Cl. 350—620 **20 Claims**



1. An all reflective multiple field of view optical system comprising:

an entrance pupil region;

first reflecting means for reflecting light from a viewed object passing through said entrance pupil region to a plane for viewing; and

second reflecting means for reflecting light from a viewed object passing through said entrance pupil region to said plane for viewing, said first or second reflecting means being an afocal three mirror anastigmat, said first and second reflecting means being movably positioned with respect to one another such that in a first position said first reflecting means or said second reflecting means is reflecting light passing through said entrance pupil region to said plane for viewing and in a second position the other of said first or second reflecting means is reflecting light to said plane for viewing wherein fields of view and afocal magnification of said first and second reflecting means are different.

5,009,495

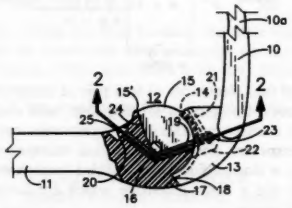
HINGE FOR EYEGLASSES

Robert D. Williams, 5374 S. Datura St., Littleton, Colo. 80120

Filed May 26, 1989, Ser. No. 358,699

Int. Cl.[5] G02C *5/14, 5/22*

U.S. Cl. 351—153 **9 Claims**



1. An improved eyeglass mounting assembly including supporting means for the lenses and a pair of temples together with means for pivotally mounting each of said temples on said supporting means adjacent respective ones of the lenses for movement about its respective pivotal axis between a folded position and an open use position, each of said means for pivotally mounting said temples comprising a bearing member having complementary bearing surfaces one on a respective one of said supporting means and the other on the respective temple, and means for maintaining said complementary bearing surfaces in face engagement with one another, aid maintaining means including a respective elongated elastic member secured under tension between the respective one of said supporting means and the respective temple for urging said complementary surfaces into face engagement and retaining said temples in position on said supporting means, each said elastic member being attached to a respective temple at one end and to a respective lens supporting means at the other.

5,009,496

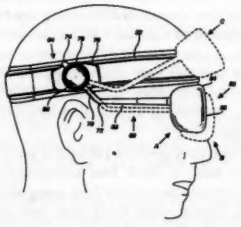
EYEGLASSES AND HEADGEAR COMBINATION

Ramer B. Holtan, Jr., 5003 E. Mercer Way, Mercer Island, Wash. 98040; Kevin L. Falk, Mercer Island, Wash.; James F. Bergman, Snohomish, Wash.; James R. Smith, Kirkland, Wash., and Kenneth E. Nelson, Redmond, Wash., assignors to Ramer B. Holtan, Jr., Mercer Island, Wash.

Filed Mar. 15, 1989, Ser. No. 324,202

Int. Cl.[5] B02C *3/00*

U.S. Cl. 351—156 **34 Claims**



1. An eyeglasses and headgear combination comprising:

headgear attachable to the head of a user;

eyeglasses attachable to said headgear, said eyeglasses including a front member, a lens, and temple members coupled to said front member, each of said temple members having a tip portion and a body portion, said tip portion being alternatively positionable extending downward or upward, the tip portion extending upward when said eyeglasses are attached to said headgear and said tip portion extending downward when said eyeglasses are attached behind said user's ear; and

a coupling member means for attaching said tip portion of said eyeglasses to said headgear, said coupling member providing a coupling to said headgear which permits said front member to be pivoted upward, with said lenses out of the line of sight of said user.

5,009,497

CONTACT LENSES UTILIZING KEEL ORIENTATION

Allen L. Cohen, 10010 Walsham Ct., Richmond, Va. 23233

Continuation-in-part of Ser. No. 120,263, Nov. 12, 1987, abandoned. This application Apr. 22, 1988, Ser. No. 185,217

Int. Cl.[5] G02C *7/04*

U.S. Cl. 351—161 5 Claims

1. An ophthalmic contact lens of (i) soft toric contact lens design such as those which are prism ballasted and (ii) aspheric rigid or soft contact lens possessing enhanced stability to translational slippage thereby facilitating rotational orientation comprising an arrangement of one or more circular or near-circular profiled grooves cut into the anterior, posterior or both lens surfaces.

5,009,498

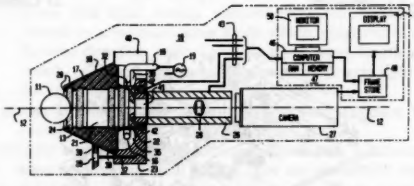
INTERCHANGEABLE KERATOSCOPE DEVICE

Martin Gersten, Brooklyn; Lars Tibbling, New York, and Roy Maus, Brooklyn, all of N.Y., assignors to Computed Anatomy Inc., New York, N.Y.

Filed Mar. 20, 1990, Ser. No. 496,016

Int. Cl.[5] A61B *3/10*

U.S. Cl. 351—212 7 Claims



1. A keratoscope image processing system comprising a light box and a conical body of translucent material having a cylindrical bore defining a series of light transmitting rings, the improvement wherein said conical body includes a plurality of light-pervious machine readable spots disposed to receive a portion of said light from said light box, said machine readable spots being arranged in a binary pattern indicative of the optical characteristics of said conical body, means for storing image processing initializing data including signal values representing predetermined types of illuminated ring light ring devices, and means responsive to said binary pattern and said signal values for modifying said processing of said keratoscope image.

5,009,499

SOUND INSULATED INTERCHANGEABLE LENS

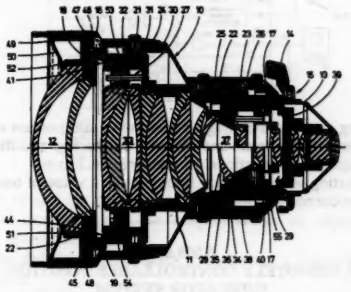
Otto Blaschek, Anwanderweg 16, D-8011 Aschheim, Fed. Rep. of Germany

Filed Dec. 22, 1989, Ser. No. 455,166

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1988, 3843838

Int. Cl.[5] G03B *31/00*

U.S. Cl. 352—35 16 Claims



1. An interchangeable lens that can be removably mounted to a motion picture camera housing, comprising

mount structure for removable attachement to said camera housing, external casing structure, said external casing structure comprising adjusting elements of said interchangeable lens, lens casing structure connecting said mount structure and said external casing structure;

first sound-absorbing buffer ring structure located on the object side of said interchangeable lens and connecting said external casing structure to said lens casing structure,

second sound-absorbing buffer ring structure located on the camera side of said interchangeable lens, said first and second buffer ring structures serving to radially support and center said external casing structure at end zones thereof on said lens casing structure,

third sound-absorbing buffer ring structure, and

a forward lens system in the forward zone of said lens casing structure and connected to said lens casing structure, said forward lens system being both centrally borne in relation to said lens casing structure and being connected to said external casing structure by means of said third sound-absorbing buffer ring structure.

5,009,500

REMOTE METHOD OF MEASURING SUBSURFACE WATER TEMPERATURES

Donald A. Leonard, Cupertino, and Harold E. Sweeney, Menlo Park, both of Calif., assignors to GTE Government Systems Corporation, Stamford, Conn.

Filed Jul. 28, 1989, Ser. No. 386,382

Int. Cl.[5] G01B *9/02*

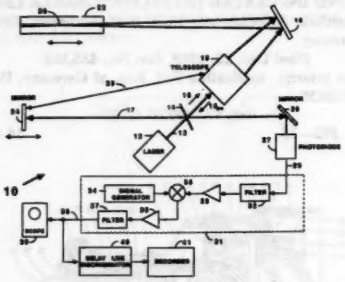
U.S. Cl. 356—43 4 Claims

1. An optical method for remotely measuring an unknown temperature T_x of a transparent medium, consisting of the steps of:

directing into said medium a pulsed laser beam comprising a plurality of pulses each having an intensity sufficient to cause stimulated Brillouin scattering in said medium and thereby causing a phase-conjugate beam to emanate from said medium;

adjustably focussing said pulsed laser beam to a plurality of focal points at different depths within said medium;

adjusting the range of a portion of said pulsed laser beam and said phase-conjugate beam to enable mixing of the pulses of each beam at the same time;



mixing said phase-conjugate beam with said portion of said pulsed laser beam and thereby producing a difference frequency proportional to temperature T_E and

converting said difference frequency to a value of temperature corresponding to T_E.

5,009,501

A REMOTELY CONTROLLABLE POSITION INDICATOR SYSTEM

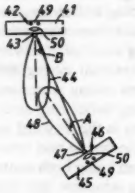
David F. Fenner, 2 Bishops Green, Barnston Great Dunmow Essex, and John S. Menown, Stoke House, Roxwell Road, Writtle Essex, both of United Kingdom

PCT No. PCT/GB87/00844, § 371 Date Jul. 27, 1989, § 102(e) Date Jul. 27, 1989, PCT Pub. No. WO88/04060, PCT Pub. Date Jun. 2, 1988

PCT Filed Nov. 26, 1987, Ser. No. 365,164

Int. Cl.[5] G01C *3/10, 1/00*

U.S. Cl. 356—152 **17 Claims**



1. A remotely controllable position indicator system, comprising a movable remote control device controllable to transmit command radiation signals, and a fixed reference station adapted to execute commands represented by said command radiation signals, said remote control device further comprising two transmitters forming one directional transmitter and said fixed reference station further comprising a receiver, means for monitoring intensity of radiation received by said receiver, means for distinguishing between radiation from one of said two transmitters and radiation from the other of said two transmitters and computer means programmed to determine the direction of said reference station from said remote control device using a comparison of monitored intensity of radiation received by said receiver from each of said two transmitters of said directional transmitter to give the direction of said receiver from said directional transmitter, in which one or more of said two transmitters is controllable to transmit radiation command signals and said receiver is arranged to receive said command signals, including switching means for said one or more of said two transmitters to initiate radiation command signals to enable an operator to selectively point at a target and then issue a command radiation signal for execution by said reference station.

5,009,502

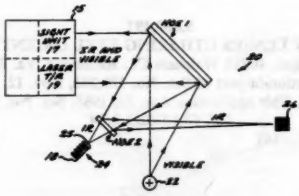
SYSTEM OF HOLOGRAPHIC OPTICAL ELEMENTS FOR TESTING LASER RANGE FINDERS

I-Fu Shih, Los Alamitos; David B. Chang, Tustin; James A. Arns, Los Angeles; Gaylord E. Moss, Marina Del Rey, and Ronald T. Smith, Redondo Beach, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Apr. 20, 1989, Ser. No. 341,010

Int. Cl.[5] G02B *5/32*; G01C *3/08*

U.S. Cl. 356—152 **10 Claims**



2. Apparatus for testing alignment of a first optical path with a second optical path, said apparatus comprising:

a detector responsive to incident energy of a first wavelength or wavelength range;

a test object for reflecting visible wavelength energy; and

holographic optical means for:

(a) receiving said visible wavelength energy from said test object, collimating said energy and directing said energy along a first optical path; and

(b) receiving energy of said first wavelength or wavelength range from along a second optical path;

said test object and said detector being cooperatively placed such that if said second optical path is properly aligned with said first optical path said holographic optical means will focus and direct said energy of said first wavelength or wavelength range onto said detector.

5,009,503

AUTOMATED CAPILLARY SCANNING SYSTEM

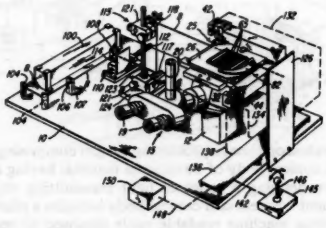
Martin J. Murphy, Jr., Dayton; Jack B. Stubbs, Waynesville, and Thomas A. Leonard, Dayton, all of Ohio, assignors to Hipple Cancer Research Corporation, Dayton, Ohio

Continuation of Ser. No. 205,725, Jun. 13, 1988, Pat. No. 4,902,132. This application Feb. 14, 1990, Ser. No. 479,959

The portion of the term of this patent subsequent to Feb. 20, 2007, has been disclaimed.

Int. Cl.[5] G01N *21/51*; C12M *1/34*

U.S. Cl. 356—339 **23 Claims**



1. Apparatus for scanning and detecting the contents of an elongated capillary chamber having an axis and defined by light transmitting means, comprising an optical sensor having a predetermined optical axis, means for supporting said light

transmitting means to position said capillary chamber with its axis substantially intersecting said optical axis, means for producing relative movement between said optical sensor and said supporting means to move said capillary chamber axially across said optical axis, means for generating a precision light beam, means for directing the light beam towards said capillary chamber at a substantial angle relative to a plane perpendicular to the axis of said chamber for illuminating the contents of said capillary chamber without producing significant reflection and refraction of light by said light transmitting means to said optical sensor, and said optical sensor including means for detecting differences in the light reflected by the illuminated contents of said capillary chamber along the length of said chamber.

5,009,504

MONOMODE OPTICAL FIBER RING INTERFEROMETRIC DEVICE WITH SEMICONDUCTOR DIODE AS LIGHT ENERGY EMISSION-RECEPTION/AMPLIFICATION MEANS

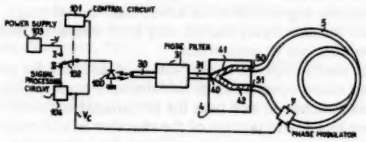
Hervé Arditty, Marly Le Roi, and Hevré Lefevre, Paris, both of France, assignors to Thomson-CSF, Paris, France

Continuation of Ser. No. 300,902, Jan. 24, 1989, abandoned, which is a continuation of Ser. No. 867,097, May 27, 1986, Pat. No. 4,842,409. This application Jun. 4, 1990, Ser. No. 532,367

Claims priority, application France, May 30, 1985, 85 08163

Int. Cl.[5] G01B 9/02

U.S. Cl. 356—350 **2 Claims**



1. A ring interferometer device comprising:

a monomode optical fiber forming a ring;

coherent light energy emission-reception means;

means for separating and mixing the radiation for directing, simultaneously and in equal parts, the emitted coherent light energy to the two ends of the monomode optical fiber and for recombining the radiation emerging from both ends of the monomode optical fiber;

a mode filter disposed between the separation and mixing means and the light energy emission-reception means;

wherein said light energy emission-reception means are formed by a semiconductor diode which, polarized in the forward direction, emits light of a given wave length and which, polarized in the reverse direction, detects light of the same wave length; and further comprising

means for biasing said diode in the forward direction for controlling the light emission thereof;

electric signal processing means for obtaining a measurement of non-reciprocal effects from any phase shift indicated by an interference signal; and

switching means and means for controlling said switching means, so as to establish alternately an electric connection between said semiconductor diode and respectively, the forward direction biasing means and the electric processing means, the switching means being switched from the emission mode to the detection mode at a period equal to double the transit time of the light in the ring interferometer.

5,009,505

OPTICAL SENSOR FOR DETERMINING CHANGES IN A DIMENSION AND/OR A TEMPERATURE OF AN OBJECT

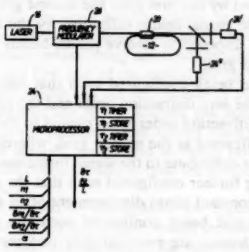
Alan R. Malvern, Bracknell, United Kingdom, assignor to British Aerospace Public Limited Company, London, England

Filed Jun. 28, 1989, Ser. No. 372,626

Claims priority, application United Kingdom, Jun. 30, 1988, 8815558

Int. Cl.[5] G01B 9/02

U.S. Cl. 356—352 **13 Claims**



1. A sensor for determining changes in at least one of a physical dimension and the temperature of an object, said sensor comprising:

means defining a first optical path having a first refractive index;

means defining a second optical path having a second refractive index different from said first refractive index, said second path being adjacent or substantially coincident with said first path;

means for introducing light into each of said paths;

frequency modulation means for applying a repeating ramp frequency modulation to the light introduced into each of said paths;

detector means for detecting resonances of the light in said first path and said second path; and

processing means responsive to a timing of the appearance of said resonances to output data representative of at least one of said physical dimension and temperature based thereon.

5,009,506

PHOTOELECTRIC POSITION-MEASURING ARRANGEMENT HAVING A PLURALITY OF SHIFTABLE GRIDS

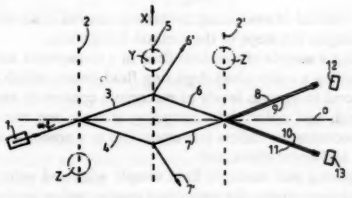
Alfons Spies, Seebruck, Fed. Rep. of Germany, assignor to Dr. Johannes Heidenhain GmbH, Traureut, Fed. Rep. of Germany

Filed Mar. 22, 1989, Ser. No. 327,300

Claims priority, application Fed. Rep. of Germany, Mar. 25, 1988, 3810165

Int. Cl.[5] G01B 9/02

U.S. Cl. 356—356 **9 Claims**



1. A photoelectric position-measuring arrangement for mea-

suring length or angles which includes first, second and third grids which are shiftable with respect to one another, which grids diffract the light eminating from a light source into partial-beams and bring the diffracted partial-beams into interference wherein the intensity modulations arising from the interference from the partial-beams are transduced by photodetectors into electrical signals which are phase shifted with respect to one another, wherein the improvement comprises:

a first grid, a second grid, and a third grid, the first grid disposed such that light from the light source impinges the first grid at an angle α relative to the grid normal (0) and is diffracted by the first grid, the second grid disposed to receive the partial-beams diffracted by the first grid, the third grid disposed to receive partial-beams diffracted by the second grid;

the first grid being configured such that only the partial-beam of the zero diffraction order and the partial-beam of the first diffraction order lying closest to the grid normal (0) are diffracted at the second grid, whereby only these two beams contribute to the signal formation, and the first grid being further configured such that the partial-beams obtain a constant phase displacement of an amount θ;

the second grid being configured such the partial-beams incident thereon are resolved only into partial-beams of their first diffraction orders, the second grid being further configured such that the partial-beams lying closest to the grid normal (0) are brought into interference by diffraction on the third grid;

the third grid being identically configured to the first grid; and

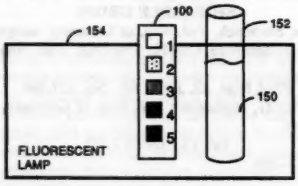
the photodetectors being disposed such that the interfering partial-beams from the third grid impinge thereon.

5,009,507

METHOD OF EVALUATING MECONIUM CONTENT OF AMNIOTIC FLUID

Michael Katz, 3848 California Ave., San Francisco, Calif. 94118

Filed Mar. 21, 1990, Ser. No. 496,684
Int. Cl.[5] G01J *3/52*
U.S. Cl. 356—421 **6 Claims**



1. A method of evaluating meconium content of an amniotic fluid sample, the steps of the method comprising:

placing a sample of amniotic fluid in a transparent medium;

providing a color chart depicting fluid colors which correspond to various levels of meconium content in amniotic fluid, said color chart including at least one meconium concentration indicia corresponding to a predefined color in said color chart; and

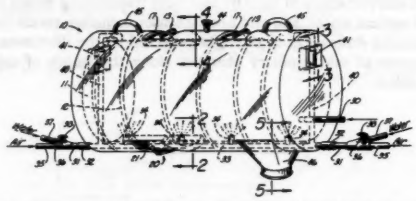
comparing said amniotic fluid sample with said color chart and determining the meconium concentration level of said amniotic fluid sample relative to said meconium concentration indicia.

5,009,508

APPARATUS FOR MIXING CONCRETE

Henry K. Wojdylo, 3816 Diamond Head Rd., Honolulu, Hi. 96816-4434

Filed Mar. 26, 1990, Ser. No. 498,716
Int. Cl.[5] B28C *5/06*; B01F *13/02, 15/02*
U.S. Cl. 366—10 **3 Claims**



1. An apparatus for mixing concrete at the point of use at a building site having sources of compressed air and water even at elevated locations wherein the apparatus comprises:

a tank, said tank having a top, a bottom, a first and second side and a first and a second end, said tank having a chamber disposed therein which is generally elliptical in cross sectional shape; and, wherein said tank has at least a substantially translucent vertical height portion which permits both the level and the viscosity of the cement contained therein to be monitored;

reinforcing rods associated with said tank to impart rigidly thereto and means associated with the top of said tank and operatively connected to said reinforcing rods for permitting said tank to be lifted to said elevated locations at the building site;

inlet means disposed in the top of said tank for permitting concrete ingredients to be introduced therethrough;

means for selectively sealing said inlet means to that said chamber can be pressurized;

outlet means disposed in the bottom of said tank for permitting mixed concrete to be withdrawn from said chamber;

means attached to said tank for introducing air under pressure to a lower portion of the chamber in said tank;

conduit means connected to said tank for introducing water into said tank;

nozzle means disposed in a lower portion of said chamber for selectively introducing air and water into said chamber,

means for connecting a supply of water under pressure to said nozzle means; and,

means for connecting a supply of air under pressure to said nozzle means; including conduit means connecting a top portion of said chamber with said air supply means for permitting air to pass from the top of said chamber to said air supply means; and, further including a one-way valve means for permitting air to flow through said conduit means from the top of the chamber to the air supply means but preventing air from flowing from said air supply means directly to the top of the chamber through said conduit means; wherein, air flowing from the top of said chamber is mixed directly with air entering said chamber from said air supply means; and, wherein mixing takes place within said chamber.

5,009,509

CLAMPING APPARATUS FOR THERMAL TRANSFER PRINTER

Robert J. Matoushek; Terrence L. Fisher, both of Rochester, and James A. Whritenor, Spencerport, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 26, 1989, Ser. No. 457,039
Int. Cl.[5] G01D *15/28*; B65H *5/02*
U.S. Cl. 346—138 **2 Claims**

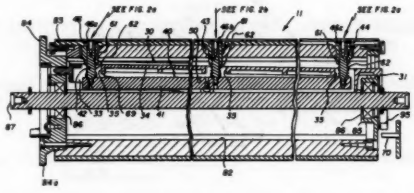
1. In a thermal transfer printer of the kind having a rotatably

mounted print drum for supporting receiver sheets for movement past a thermal print station, improved apparatus for clamping such receiver sheets comprising:

(a) actuator means mounted on one end of said drum for movement between clamping and unclamping positions;

(b) lever means pivotally mounted at the other end of said drum and having a longitudinal body extending axially within said drum interior to a follower end in actuatable relation to said actuator means;

(c) clamping means having:



(i) an elongated portion extending axially within said drum in generally opposing relation to said longitudinal body of said lever means;

(ii) a plurality of axially spaced arms extending radially from said body to said drum periphery; and

(iii) a clamp member coupled to said arms and extending axially over a longitudinal section of said drum periphery; and

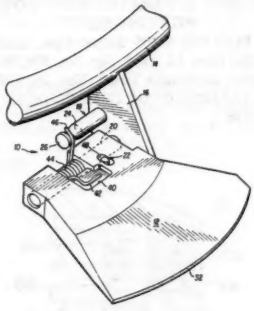
(d) means for pivotally coupling said elongated portion of said clamping means to a region of said lever means that is between said drum ends.

5,009,510

SCRAPER MOUNTING ARRANGEMENT FOR FOOD PROCESS AGITATORS

Valentino Gabriele, Baltimore, Md., assignor to J. C. Pardo and Sons, Baltimore, Md.

Filed Sep. 27, 1990, Ser. No. 588,855
Int. Cl.[5] B01F *11/00*
U.S. Cl. 366—311 **18 Claims**



1. In combination with an agitator mounted for rotation within a container within which materials are being mixed, apparatus mounted on the agitator for scraping walls of the container, comprising:

scraper means positioned in scraping relation with at least portions of the walls of the container for preventing adhesion of the materials to said walls, the scraper means having aligned bores formed in one end and a cutout portion disposed between the aligned bores, the scraper means having an aperture formed therein;

mounting means carried by the agitator and being received within the aligned bores of the scraper means for mounting the scraper means for pivotal motion relative to the agitator;

adjusting means carried by the agitator for constantly adjusting the position of the scraper means to accommodate surface contours of the walls and to accommodate surface wear of at least portions of the scraper means in order to maintain the scraper means in scraping relation with said walls on rotation of the agitator, the adjusting means comprising spring loading pin means spaced from the mounting means and carried by the agitator for providing a surface against which a force can be directed, the adjusting means further comprising a coiled spring having a substantially cylindrical body portion, a first end and a second end, the body portion of the coiled spring being disposed within the cutout portion of the scraper means, the mounting means being received through the coil body portion, the first end of the coiled spring biasing against the scraper means and the second end of the coiled spring biasing against the spring loading pin means, the coiled spring thereby exerting a bias against the scraper means to force the scraper means into scraping relation with the walls of the container and to hold the scraper means under tension; and,

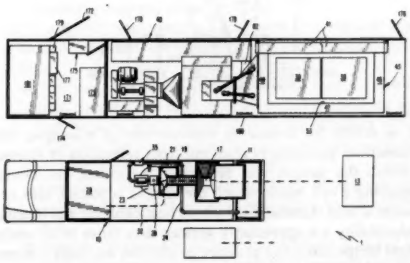
stop means carried by the agitator for limiting the pivotal motion of the scraper means on the mounting means to a predetermined arcuate angle, the stop means comprising an L-shaped pin having a proximal leg mounted to the agitator and a distal leg receivable within the aperture formed in the scraper means on pivoting of the scraper means toward the stop means, portions of the scraper means contacting the proximal leg to prevent further pivoting motion of the scraper means, the scraper means being formed with a recess communicating with the aperture in the scraper means, the proximal leg of the stop means being received into the recess on pivoting of the scraper means toward the stop means, the bottom wall of the recess contacting the proximal leg of the stop means to prevent further pivoting motion of the scraper means.

5,009,511

INORGANIC RECYCLING PROCESS

Leonard S. Sarko, Dublin, and Richard S. Lyon, Galion, both of Ohio, assignors to Inorganic Recycling Incorporated, Columbus, Ohio

Continuation of Ser. No. 110,447, Oct. 20, 1987, abandoned.
This application Jan. 26, 1990, Ser. No. 471,042
Int. Cl.[5] B01F *7/08*
U.S. Cl. 366—348 **9 Claims**



4. A method of recycling inorganic hazardous waste material into useful products by chemically fixing inorganic constituent materials of said inorganic hazardous waste into a silicate matrix comprising the steps of:

(a) loading an inorganic hazardous waste material into a mixing chamber;

(b) mixing said material in said chamber with chemicals selected from the group consisting of inorganic alkaline

materials, acid materials, water and a combination of two or more thereof;

(c) causing an oxidation-reduction reaction to occur;

(d) mixing said oxidation-reduction reaction product with further chemicals comprising adding bonding clay to said oxidation-reduction reaction product and blending for 3–30 minutes, and thereafter adding silica sand thereto and blending for 3 to 30 minutes;

(e) conveying said mixed material to a heating chamber;

(f) heating said mixed material at 1800°–2250° F. for 60–120 minutes to cause vitrification to occur and to chemically fix said inorganic constituents of said inorganic hazardous waste into a silicate matrix to produce a vitrified, silicate-based, inert material;

(g) removing from said material particulate laden gas formed during said heating step, said particulate laden gas including solid and liquid particulates and gaseous contaminants; and

(h) scrubbing said gas with a scrub liquid to remove particulates therefrom and adjusting the pH of said scrub liquid to transfer contaminants from the gas phase to the liquid phase.

5,009,512

DEVICE AND METHOD FOR MEASURING THE DEFORMATIONS OF A SAMPLE

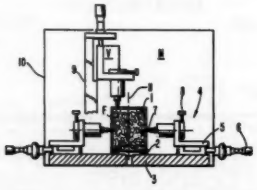
Jacques Lessi, Maule; Philippe Perreau; Daniel Bary, both of Rueil Malmaison, and Guy Grard, Argenteuil, all of France, assignors to Institute Francais du Petrole, Cedex, France

Continuation of Ser. No. 213,138, Jun. 29, 1988, abandoned. This application May 9, 1990, Ser. No. 521,012

Claims priority, application France, Jun. 30, 1987, 87 09263

Int. Cl.[5] G01N *25/00*; G01B *7/02, 21/02*

U.S. Cl. 374—6 **24 Claims**



1. A device for measuring deformations of a sample, said deformations particularly resulting from relaxation of stresses to which the sample was previously subjected, the device comprising a cell inside which the sample is placed, said cell contains a fluid thermal mass whose heat capacity and thermal conductibility are appreciably greater than those of air under normal temperature and pressure conditions, and sensor means cooperable with said sample for sensing displacements of the sample so as to enable a measurement of deformations thereof, wherein the sample is a solid impregnated by at least one fluid, the fluid thermal mass is chosen so that said impregnation fluid concentration in the sample is not substantially modified during measurement of the deformations and wherein said fluid thermal mass is chosen so as not to be introduced into the sample.

5,009,513

METHOD OF MEASURING QUANTITY OF HEAT APPLIED TO OPTICAL FIBER

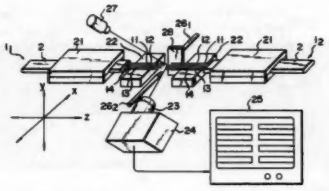
Tsutomu Onodera, and Takeshi Yamada, both of Sakura, Japan, assignors to Fujikura Ltd., Tokyo, Japan

Continuation of Ser. No. 283,228, Dec. 12, 1988, abandoned. This application Aug. 23, 1990, Ser. No. 572,343

Claims priority, application Japan, Dec. 16, 1987, 62-318435

Int. Cl.[5] B65H *69/08*; G01K *17/00*; G02B *6/255*

U.S. Cl. 374—31 **9 Claims**



1. A method of measuring a quantity of heat applied to an end of each of exposed fiber portions of a ribbon optical fiber, comprising the steps of:

measuring a distance between an end of each of the exposed fiber portions of a ribbon optical fiber before heating and the end of each of the exposed fiber portions after heating, which comprises the steps of,

picking up a first position of said end, before heating, of each exposed fiber portion of said optical fiber;

picking up a second position of said end, after heating, of each exposed fiber portion of said optical fiber; and determining said distance by subtracting said

second position from said first position; and

determining a quantity of heat applied to the end of each of said exposed fiber portions based on said measured distance, by using a heat characteristic of the ribbon optical fiber, said heat characteristic indicating a relationship between a quantity of heat applied to the end of each of the exposed fiber portions and an amount of retraction of the end of each of the exposed fiber portions.

5,009,514

METHOD AND APPARATUS FOR PROTECTION AGAINST HEAT

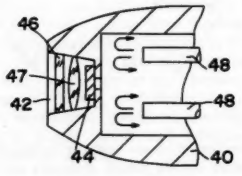
Ardon Gador, POB 570, 55105, Kiryat Ono, Israel

Filed Nov. 14, 1988, Ser. No. 270,793

Claims priority, application Israel, Nov. 26, 1987, 84611

Int. Cl.[5] G01J *05/04*; G01K *01/14, 13/02*

U.S. Cl. 374—138 **10 Claims**



1. A method for slowing the convective heat transfer rate from a high total enthalpy fluid flow to an area of an object with a heat sensitive element mounted thereat, facing the fluid flow and located at the stagnation zone of the object, comprising the step of,

recessing said heat sensitive element into said object at said stagnation zone to provide a substantially unvented recess facing said fluid flow, the depth of said heat sensitive element in said object having a ratio to the diameter of

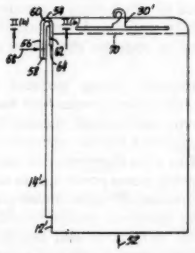
said recess at the surface of said object for a recess of circular cross section, or to the recess dimension at the surface of said object substantially perpendicular both to the direction of said flow and to the stagnation line of the stagnation zone for a recess of other than a circular cross section, to reduce the radial velocity of flow parallel to the area of said heat sensitive element within said recess, thereby slowing the heat transfer to said heat sensitive element.

5,009,515

PLASTIC FILM BAG WITH A MULTI-LAYERED BIGHT THROUGH WHICH A HANGER EXTENDS AND RELATED METHODS

Ronald Bennett, Bay Shore, N.Y., assignor to Ultra Creative Corp., Brooklyn, N.Y.

Filed Jun. 27, 1989, Ser. No. 373,154
Int. Cl.[5] B65D *33/14*
U.S. Cl. 383—23 **8 Claims**



1. A bag comprising facing first and second sheets of plastic film having upper and lower extremities, at least one of said sheets at the upper extremity thereof constituting a multi-layered U-shaped bight, including a multi-layered curved section and multi-layer legs extending from said curved section, a heat seal extending completely through said bight so that the bight and bag are welded closed, the other sheet extending fully into said bight and at least closely adjacent said curved section, and a hanger generally within said bight but including a portion extending through and outwardly of said bight.

5,009,516

SHOPPING CONTAINER DEVICE

Carol A. Geeck, 827 Plumosa, Vista, Calif. 92083

Filed Aug. 27, 1990, Ser. No. 572,680
Int. Cl.[5] B65D *30/10*
U.S. Cl. 383—37 **9 Claims**

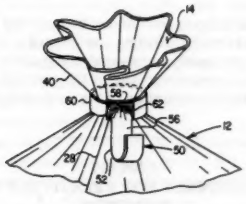
1. A shopping container device, comprising:
(a) a first, storage bag-size, collapsible bag, having an open top and a closed bottom;
(b) a flexible, non-stretchable handle attached about said open top for carrying said bag when full;
(c) a second, smaller collapsible bag having a closed bottom and an openable top, said top biased normally closed;
(d) flexible means joining said open top of said first-bag to the inside of said second-bag a short distance below its biased-closed top;
(e) said bottom of said second-bag folded flat to form a short flap;
(f) said flap folded about one portion of a small ring and attached to itself to form a ring-holding closed loop; and,
(g) a normally closed, openable snap anchored to said ring for attachment to a user's vehicle ignition keys;
(h) said smaller second-bag of an overall size sufficient to completely contain said first-bag collapsed therein, and of a length sufficient to contain the ignition keys when said first-bag is removed therefrom.

5,009,517

PLASTIC FILM BAG WITH INTEGRAL PLASTIC FILM TIE ELEMENT, AND ASSOCIATED FABRICATION METHODS

Gary L. Rutledge, Dallas, Tex., assignor to John C. Marrelli, Tustin, Calif.

Continuation of Ser. No. 321,719, Mar. 10, 1989, Pat. No. 4,948,268, which is a division of Ser. No. 117,209, Nov. 4, 1987, Pat. No. 4,854,735. This application Feb. 2, 1990, Ser. No. 474,170
Int. Cl.[5] B65D *33/28*
U.S. Cl. 383—72 **4 Claims**



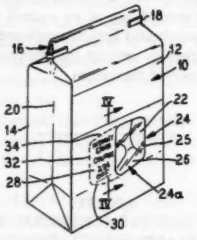
1. A plastic film bag having integral closure tie apparatus, comprising:
a plastic film bag having:
an open upper end,
a closed lower end,
a pair of opposite side edge portions, and
a pair of opposite side walls interconnecting said side edge portions and said lower end; and
tie means fixedly secured to said plastic film bag and usable to close said open upper end thereof, said tie means including:
an elongated closure tie element formed from a relatively limp material and having an inner end portion, an outer end portion, and a longitudinally intermediate portion extending between said inner and outer end portion,
means for firmly securing said inner end portion of said tie element to an attachment area of one of said side edge portions of said bag adjacent said upper end of said bag, and
an aperture formed through said attachment area and said inner end portion of said tie element secured thereto,
said tie element being configured and positioned to permit its use in closing the bag by wrapping said longitudinally intermediate portion of said tie element around said upper end of said bag to form a loop therearound, passing said outer end portion of said tie element through said aperture, and pulling on said outer end portion to cause said loop to constrict around, frictionally engage, and close said upper end of said bag.

5,009,518

WINDOW-STYLE BAG WITH INTEGRAL COUPON

Mark Faltynek, Chicago, Ill., assignor to Bagcraft Corporation of America, Chicago, Ill.

Filed Aug. 8, 1989, Ser. No. 390,826
Int. Cl.[5] B65D 33/04
U.S. Cl. 383—106 6 Claims



1. An open-topped bag for carrying goods on the inside thereof, which comprises bottom, side, back and front walls, said front wall having a window defined by an aperture area and a transparent film secured to said front wall on the inside thereof and overlying said aperture area:

wherein the improvement comprises said front wall including a coupon defining section having a perimeter and separably connected to but integral with said front wall in said aperture area, said section being connected to the front wall along less than the section's entire perimeter and constructed to overlie at least a portion of said transparent film;

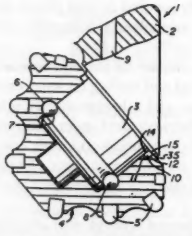
whereby said coupon section can be removed from the bag without adversely affecting the integrity of the bag and exposing previously unexposed transparent film so as to provide for greater viewing of the contents after separation than before separation of the coupon section from the bag.

5,009,519

SEALING ASSEMBLY FOR RELATIVELY MOVABLE MEMBERS

David M. Tatum, 9251 Burdine, No. 386, Houston, Tex. 77096

Continuation-in-part of Ser. No. 55,126, May 28, 1987, Pat. No. 4,762,189. This application Aug. 3, 1988, Ser. No. 227,624
The portion of the term of this patent subsequent to Aug. 9, 2005, has been disclaimed.
Int. Cl.[5] F16C 33/76; F16J 15/26, 15/28, 15/38
U.S. Cl. 384—94 35 Claims



1. A sealing assembly for a plurality of surfaces defining an annular space having a longitudinal axis, for sealing relatively movable members at temperatures up to about 1000° F., comprising

first and second annular shaped members of a hard, but elastically deformable material,

each annular shaped member being generally of an L-shape configuration and substantially of identical shape and being assembled to be in opposed mirror relation so that substantially identical surfaces of the annular shaped members face in opposite directions, one annular shaped member having a first outer radially facing annular surface for being in substantially surface-to-surface contact with one of the relatively movable members and the other annular shaped member having a first inner radially facing annular surface for being in substantially surface-to-surface contact with the other relatively movable member, said one annular member having a second inner radially facing annular surface for being in substantially surface-to-surface contact with said other relatively movable member, said other annular shaped member having a second outer radially facing annular surface for being in substantially surface-to-surface contact with said one relatively movable member, said first outer radially facing annular surface and said first inner radially facing surface being substantially identical, said second inner facing radially annular surface and said second outer facing annular surface being substantially identical, said radially facing annular surfaces of each respective annular shaped member being joined by an axially facing annular surface for engaging in substantially surface-to-surface contacting relationship an adjacent surface to which each respective annular shaped member is axially positioned, said axially facing annular surfaces facing in opposite directions away from each other,

said annular members having surfaces facing inwardly toward each other in being assembled and shaped to form an annular cavity and a small spacing between adjacent opposed edges of said annular members defining radially and axially offset gaps therebetween, and

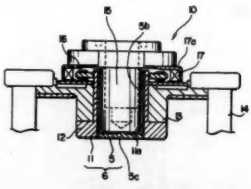
annular elastic spring means positioned in said annular cavity between and substantially surrounded on all sides thereof by said annular members except at said offset gaps and spaced from all surfaces of said annular space and said relatively movable members biasing said annular members apart in directions both radially and axially of said longitudinally axis when installed with said annular members under compression toward each other.

5,009,520

DYNAMIC PRESSURE TYPE BEARING AND SPINDLE UNIT

Toshimi Takajo, Fujisawa; Hiromitsu Asai, Samukawa, and Kiyoshi Haginuma, Fujisawa, all of Japan, assignors to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 18, 1990, Ser. No. 510,619
Claims priority, application Japan, Apr. 26, 1989, 1-106866
Int. Cl.[5] F16C 32/06, 33/22
U.S. Cl. 384—100 7 Claims



1. A dynamic pressure type bearing comprising:

a hollow outer cylinder made of a metal; and

a hollow inner cylinder made of a synthetic resin and having an outer cylindrical surface fastened to an inner cylindrical surface of said outer cylinder and having an inner cylindrical surface fitting a rotatable shaft;

at least one of the outer cylindrical surface of the rotatable shaft and the inner cylindrical surface of said inner cylinder defining a dynamic pressure producing groove therein; and

said inner cylinder being made of a thermosetting resin

containing a 5 wt % to 75 wt % heat treated phenol resin powder and a 5 wt % to 75 wt % silicon dioxide, the total content of the heat treated phenol resin powder and the silicon dioxide being 50 wt % to 80 wt %.

5,009,521

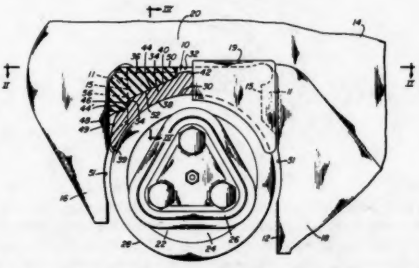
RAILWAY TRUCK AND BEARING ADAPTER THEREFOR, AND METHOD FOR CONTROLLING RELATIVE MOTION BETWEEN TRUCK COMPONENTS

Donald Wiebe, Sewickley, Pa., assignor to A. Stucki Company Division of Hansen, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 379,934, Jul. 14, 1989, abandoned. This application May 11, 1990, Ser. No. 522,472

Int. Cl.[5] F16C *23/04*

U.S. Cl. 384—191.1 **27 Claims**



1. A bearing adapter assembly adapted for engagement within a pedestal opening of a railway truck side frame for supporting such a railway truck side frame with respect to a railway truck wheelset bearing comprising:

a rigid adapter means adapted to be supported with respect to such a wheelset bearing in a manner to accommodate axial rotation of such a wheelset with respect to said rigid adapter means;

said rigid adapter means being further adapted to be received within such a pedestal opening with outer surface portions thereof disposed in spaced relationship with respect to given inner surface portions of such a pedestal opening;

resiliently deformable elastomeric means engageable with said outer surface portions and adapted to engage such given inner surface portions for support of such a side frame with respect to said rigid adapter means; and

said elastomeric means being resiliently deformable under loads borne thereby while supporting such a side frame in a manner to exert between said rigid adapter means such a side frame both laterally and longitudinally directed confining forces of sufficient magnitude to restrain lateral and longitudinal movement of said rigid adapter means with respect to such a pedestal opening in operation; and

said elastomeric means being further resiliently deformable in a manner to permit said rigid adapter means to rotate with respect to such a pedestal opening about an axis of rotation extending generally axially of such a wheelset.

5,009,522

REDUCED FLOW BEARING

Charles J. Hahn, assignor to General Motors Corporation, Detroit, Michigan, Mt. Clemens, Mich.

Filed Apr. 2, 1990, Ser. No. 502,723

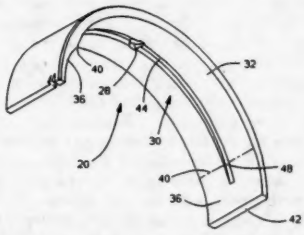
Int. Cl.[5] F16C *33/10*

U.S. Cl. 384—288 **6 Claims**

1. A journal bearing for internal combustion engines wherein a rotatable journal is received within a cylindrical opening defined jointly by a pair of detachably secured members, said bearing comprising:

a semi-cylindrical bearing shell adapted to be opposedly received within said opening to define a generally semi-cylindrical, inwardly facing bearing surface adapted to surround a portion of said journal in close fitting bearing relationship with clearance for formation therebetween of a load carrying lubricating oil film;

said inwardly facing bearing surface divided circumferentially into a concentric central portion and a pair of eccentric end portions, said portions each extending axially the full width of said surface, said concentric central portion being equidistant at all points from said central axis and extending circumferentially a predetermined angular dimension, said eccentric end portions extending outwardly from the opposite ends of said central portion and of progressively increasing distance from said central axis toward the ends of said bearing shell of said shell;



said inwardly facing bearing surface further having an eccentric lubricant supply groove extending circumferentially a predetermined angular dimension larger than said concentric central portion, said groove tapering from a point of maximum depth within said concentric central portion to terminate within each of said eccentric end portions thereby forming lubricant metering orifices at the interface of said concentric central portion, said eccentric end portions and said eccentric lubricant supply groove to meter the flow of lubricant from said groove to said eccentric end portions; and

a lubricant supply opening extending through said bearing shell to intersect said supply groove for supplying lubricant from an external source to said bearing.

5,009,523

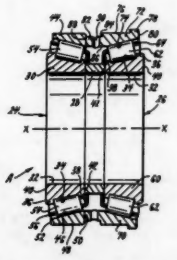
DOUBLE ROW BEARING ASSEMBLY

Russell F. Folger, and Gerald P. Fox, both of Stark County, Ohio, assignors to The Timken Company, Canton, Ohio

Filed Jul. 20, 1989, Ser. No. 382,994

Int. Cl.[5] F16C *19/38, 33/66*

U.S. Cl. 384—475 **22 Claims**



1. In combination with a housing having a bore and a shaft which extends through the housing and has a pair of radially directed abutments and a bearing seat between the abutments, an improved bearing assembly for supporting the shaft between the abutments so that the shaft will rotate about an axis of rotation, said bearing assembly comprising: first and second bearings, each including an outer race having an inwardly

presented raceway, an inner race having an outwardly presented raceway which faces the raceway of the outer race, and rolling elements arranged in a single row between the raceways of the outer and inner races, the raceways and rolling elements of each bearing being configured and oriented such that the bearing will transmit an axial load in one direction as well as a radial load, the outer races of the two bearings being in the bore of the housing, the inner races of the two bearings being on the bearing seat of the shaft, the bearings being oriented in opposition so that one transmits axial loads in one direction and the other transmits axial loads in the other direction, the outer race of the second bearing being captured in the housing so that it cannot shift axially with respect to the housing, the outer race of the second bearing further having an extension formed integral therewith and projected axially toward the outer race of the first bearing, the extension being against the outer race of the first bearing so as to position the outer race of the first bearing in a predetermined axial position with respect to the outer race of the second bearing, the extension on the outer race for the second bearing having an outer diameter that is less than the outer diameter of the remainder of the outer race for the second bearing and also less than the outer diameter for the outer race of the first bearing so as to provide an annular cavity between the two outer races, the extension having ports extended radially through it for enabling a fluent lubricant to pass from the annular cavity into the region between the inwardly and outwardly presented raceways of the two bearings.

5,009,524

DOUBLE ROW, SELF ALIGNING ROLLER BEARING

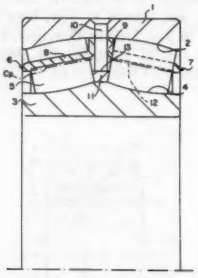
Thomas Dittenhoefer, Dittelbrunn, Fed. Rep. of Germany, assignor to SKF GmbH, Schweinfurt, Fed. Rep. of Germany

Filed May 10, 1990, Ser. No. 521,821

Claims priority, application Fed. Rep. of Germany, May 20, 1989, 3916552

Int. Cl.[5] F16C *33/66*

U.S. Cl. 384—475 **5 Claims**



1. Two-row, self-aligning roller bearing comprising an outer ring with a spherical bore defining an outer raceway, an inner ring having raceways, and rollers between the rings rolling on said inner and outer raceways, these rollers having a convex lateral surface, a cage for guiding the rollers, said cage being split into two halves, each half holding one row of rollers and each half of the cage being guided in a sliding manner in the bore of the outer ring, a loose guide ring on the inner ring between the rows of rollers, a lubricant supply hole in said outer ring, the cage halves (6, 7) being located at a distance (A) from each other which is equal to or greater than the diameter of the oil supply hole (10).

5,009,525

ROLLER SEATING

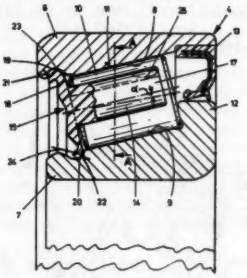
Uwe Brockmüller, Oberwerrn, and Hans-Gerd Weber, Poppenhausen, both of Fed. Rep. of Germany, assignors to SKF GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Nov. 22, 1989, Ser. No. 440,091

Claims priority, application Fed. Rep. of Germany, Dec. 10, 1988, 3841629

Int. Cl.[5] F16C *33/49*

U.S. Cl. 384—576 **11 Claims**



1. A bearing seating arrangement comprising an outer ring, an inner ring, a bendable elastic cage and rolling elements between said inner and outer rings and positioned to roll in a circumferential direction, each rolling element being installed between essentially axially extending spacers of said cage, the spacers having holding surfaces partially surrounding the rolling surfaces of the rolling elements, at least one of the two ends of the spacers being solidly attached to at least one radially inward and/or radially outward extending projection of the cage, said projection(s) facing a respective revolving shoulder surface(s) of the inner or outer ring, said projection(s) being mounted to be pushed with a directed pre-tensioning force against the circumference of the respective shoulder surface of one of said inner ring or the outer ring, said pre-tensioning force being in a direction to elastically radially dislocate said holding surfaces against said rolling elements.

5,009,526

METHOD OF ADJUSTING A PRINTING GAP IN A PRINTER

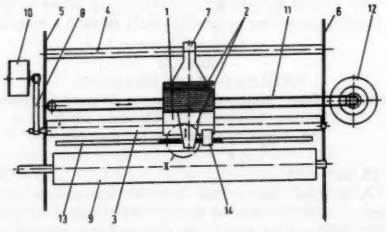
Rolf Kirchhof, Freusburg, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 10, 1990, Ser. No. 508,034

Claims priority, application Fed. Rep. of Germany, Apr. 21, 1989, 3913073

Int. Cl.[5] B41J *25/28*

U.S. Cl. 400—56 **15 Claims**



1. A method of adjusting a printing gap in a printer between a printing head and a printing support comprising:

(a) moving the printing head to and fro in first reciprocating directions between direction switching pints and then

simultaneously moving the head forwards in a second direction toward the printing support to contact the support,

(b) determining the variation of a parameter characteristic value of the reciprocating to and fro movement caused by contact of the printing head with the printing support,

(c) said variation results, when a given characteristic value is reached, in stopping the forward movement, and

(d) moving the printing head, starting from this stopped forward movement position, in which the printing gap is at "zero", backwards a desired value of the printing gap.

5,009,527

THERMAL TRANSFER COLOR PRINTER WITH SHEET RETAINING AND GUIDING STRUCTURE ADJACENT PLATEN

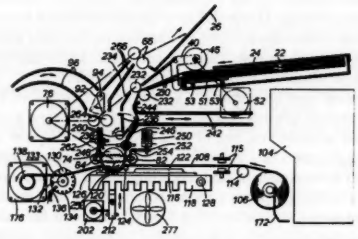
Masasumi Yana; Hitoshi Nagato, both of Yokohama; Kiyoshi Yamada, Tokyo; Shyoji Ueno, and Kunihiro Shibuya, both of Yokohama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan

Continuation of Ser. No. 742,850, Jun. 10, 1985, abandoned, which is a continuation of Ser. No. 554,319, Nov. 22, 1983, abandoned. This application Mar. 3, 1986, Ser. No. 834,650

Claims priority, application Japan, Nov. 24, 1982, 57-204526

Int. Cl.[5] B41J *2/325, 35/16, 13/036*

U.S. Cl. 400—120 **3 Claims**



1. A thermal transfer color printer for printing a color image on individual separate sheets of a recording media having front and rear end portions comprising:

feed means for feeding separate sheets of a recording media one by one into said thermal transfer color printer;

a reversible platen roller to transport a single sheet of recording media received from said feed means;

retention means adjacent said reversible platen roller for retaining and guiding the sheet of recording media along the surface of said platen roller as the sheet of recording media moves in both a first and reverse direction during printing of a color image;

a multicolored ink ribbon supported to move across said platen roller with one face of said ink ribbon in heat transfer relationship with the sheet of recording media, said ink ribbon having a plurality of color segments successively arranged along its length;

a thermal printhead having thermal elements which are selectively energized by color component electrical signals representing the color image to be printed on the sheet of recording media, said printhead being positioned with said thermal elements facing the surface of said platen roller in heat transfer relatioship with said multicolored ink ribbons;

printhead moving means for selectively moving said thermal printhead up and down so that in the up state said printhead presses said ink ribbon and said sheet of recording media onto the surface of said reversible platen roller for thermally transferring colored ink from said ink ribbon onto said sheet of recording media when said thermal elements are energized and in the down state said printhead is disengaged from said reversible platen roller;

ink ribbon drive means for transporting said multicolored ink ribbon in said first direction;

platen roller drive means for driving said reversible platen roller to transport the sheet of recording media in said first direction without disengaging said retention means from the rear end portion of the sheet of recording media, said platen roller drive means transporting the sheet of recording media at substantially the same rate as said ink ribbon, said platen roller drive means also including reverse drive means for driving said reversible platen roller in said reverse direction to transport the sheet of recording media in a second direction opposite said first direction without disengaging said retention means from the front end portion of the sheet of recording media, wherein said platen roller drive means includes means to prevent said sheet of recording media from exiting said printer during printing of said color image on said recording media; and

electrical circuit means connected to said thermal printhead for supplying the color component electrical signals to said thermal elements while the sheet of recording media is transported in the first direction.

5,009,528

DOT PRINT HEAD

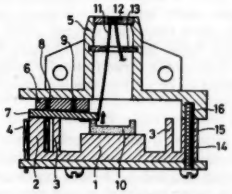
Masami Horii; Shigeo Komakine; Kuniaki Ochiai, and Takashi Kondoh, all of Shizuoka, Japan, assignors to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed May 26, 1989, Ser. No. 357,901

Claims priority, application Japan, May 27, 1988, 63-130001; Nov. 4, 1988, 63-279093; Apr. 7, 1989, 1-89122

Int. Cl.[5] B41J *2/235*

U.S. Cl. 400—124 **2 Claims**



1. A dot print head comprising: a yoke having a peripheral portion; a plurality of cores having end surfaces formed integrally with the yoke and arranged in a circumferential ring on the peripheral portion of the yoke; solenoid coils wound respectively around the cores; an armature support having end surfaces formed integrally with the yoke along and inside the circumferential ring of cores; armatures having front, middle, and rear portions each fixedly provided with a stylus at the front portion thereof and supported at the middle portion thereof for swinging motion on the armature support, said armatures being biased so that the respective rear portions thereof are separated from the end surfaces of the corresponding cores while the solenoids coils are not energized; and an armature holding member disposed opposite to the yoke with a predetermined gap therebetween and holding the armatures for swinging motion on the armature support; a plurality of joining parts having contact surfaces located on the circumferential ring of the yoke and a second plurality of joining parts also having contact surfaces located on the armature holding member at positions corresponding respectively to the joining parts located on the yoke and means located on said circumferential ring and passing through said contact surfaces to hold the contact surfaces of said yoke against the contact surfaces of said armature holding member.

5,009,529

MATRIX PRINT HEAD OF HINGED-CLAPPER-ARMATURE CONSTRUCTION

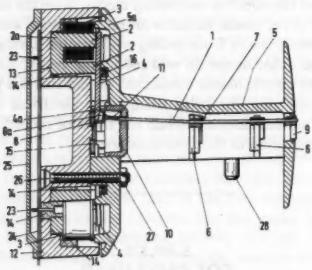
Bernd Gugel, Ulm-Einsingen; Clemens Kaufmann, Ulm; Herbert Kitzberger, Oberstotzingen, and Kurt Röhrer, Niederstotzingen, all of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany

Filed Nov. 30, 1989, Ser. No. 443,754

Claims priority, application European Pat. Off., Dec. 1, 1988, 88730266.9

Int. Cl.[5] B41J *2/235*

U.S. Cl. 400—124 21 Claims



1. A matrix pin print head of the hinged clapper armature construction with several pin systems comprising

a magnetic yoke limb pair for each pin system including an individual outer magnetic yoke limb;

an electromagnetic coil;

a hinged clapper armature having opposed notches;

a print pin having at an end a pin connection point;

a circumferentially closed ring;

an electromagnetic coil support forming with the magnetic yoke limb pairs a single circular piece component and wherein the outer individual magnet yoke limb and wherein, in each case, the magnet yoke limb pairs are disposed on a radial line passing through the pin connection point, and wherein each radially inner magnet yoke limb is formed to be part of the circumferentially closed ring;

a shell;

guide means attached to and projecting from the shell and receiving means disposed in the closed ring, said opposed notches being aligned with said receiving means, said guide means being received in said opposed notches and said receiving means to confine the pivoting motion of the hinged clapper armatures.

5,009,530

APPARATUS FOR REVERSE RECORDING IMAGE AND COVERING BY PROTECTIVE MEDIUM

Susumu Kuznya, Gifu; Seiji Shimizu; Mikio Kato, both of Nagoya; Yujiro Ishikawa, Toyota; Takashi Sakai, Nagoya, and Eiji Yuki, Owariasahi, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Oct. 24, 1988, Ser. No. 261,318

Claims priority, application Japan, Oct. 31, 1987, 62-167673[U]; Dec. 21, 1987, 62-323429

Int. Cl.[5] B41J *2/325*

U.S. Cl. 400—188 11 Claims

1. A recording apparatus, comprising:

an apparatus body having a front section on the side of an operator of the apparatus and a rear section remote from the operator's side;

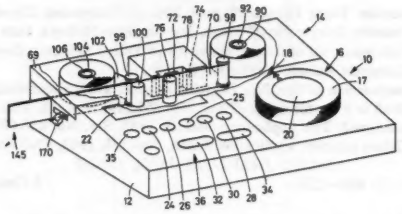
medium feeding means supported by said apparatus body, for feeding a substantially transparent recording tape along a predetermined feed path defining a boundary between said front and rear sections, such that one of opposite surfaces of the tape faces the operators side;

ribbon feeding means disposed in said rear section of said apparatus body, for feeding an ink ribbon along a portion of said predetermined feed path;

recording means including a stationary thermal head disposed in said rear section of said apparatus body, for recording an image on the other of said opposite surfaces of said tape, via said ink ribbon fed between said tape and said thermal head;

a platen disposed in said front section of said apparatus body, in facing relation with said thermal head, for supporting said tape in contact with one surface of the tape;

control means for controlling said recording means, said medium feeding means and said ribbon feeding means, such that said image is laterally reversed as viewed in a first direction from said recording means toward said



other surface of the medium, with respect to a nominal desired image as viewed in a second direction from said front section toward said one surface of the tape, whereby the laterally reversed image is seen as said nominal desired image when view in said second direction;

a backing tape comprising a substrate, two adhesive layers formed on opposite surfaces of said substrate, and a release layer provided on one of said two adhesive layers; and

means disposed at a position along said predetermined feed path downstream of said recording means, for superposing said backing tape on a recorded portion of said recording tape such that said backing tape is bonded at the other of said two adhesive layers thereof to said other surface of said recording tape.

5,009,531

COLOR INK RIBBON AND PRINTER USING THIS RIBBON

Seiji Koike, Shizuoka, Japan, assignor to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed Jan. 16, 1990, Ser. No. 464,949

Claims priority, application Japan, Jan. 20, 1989, 1-11634

Int. Cl.[5] B41J *31/09*

U.S. Cl. 400—240.3 16 Claims

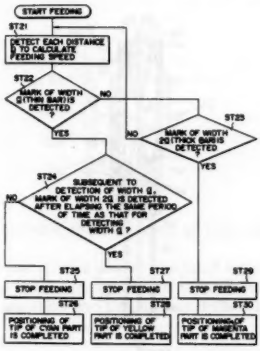
1. A printer system comprising:

an ink ribbon body on which a plurality of kinds of ink portions are arranged, said ink portions being arranged along a feed direction of said ink ribbon body;

means for discriminating the kinds of said ink portions and for providing ink kind information, said discriminating means being arranged on said ink ribbon body in correspondence with each of said ink portions;

means for detecting a feeding speed of said ink ribbon body and for providing ribbon speed information, said detecting means being arranged on said ink ribbon body; and

means for determining the kind of ink portion which is subsequent to a current ink portion to be used by the



printer system, according to said ink kind information and said ribbon speed information.

5,009,532

PAPER FEEDING APPARATUS FOR ACCOMMODATING DIFFERENT LENGTHS OF RECORDING MEDIA FOR USE WITH A PRINTER

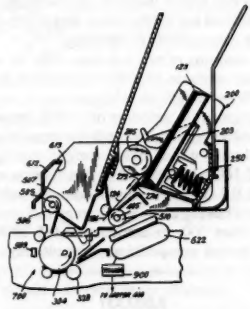
Hiroyuki Akazawa, Suwa, and Toshihiro Imae, Hino, both of Japan, assignors to Seiko Epson Corporation, Tokyo, Japan

Filed May 16, 1988, Ser. No. 194,667

Claims priority, application Japan, May 18, 1987, 62-120717

Int. Cl.[5] B41J *13/03*

U.S. Cl. 400—636.2 **30 Claims**



1. A paper feeding apparatus associated with a printer having a platen, comprising:

driving means for rotating the platen in first and second directions;

storage means for holding a plurality of individual recording media and including separating means for controlling the release of individual recording media from the storage means;

roller means for removing individual recording media from the storage means;

auxiliary roller means disposed along a path travelled by the individual recording media and between the roller means and platen for advancing the individual recording media towards the platen; and

transmission means for rotating said roller means to remove individual recording media from the storage means in response to rotation of said platen in the first direction and for rotating said auxiliary roller means to advance the recording media in response to rotation of said platen in the first and second directions;

wherein said auxiliary roller means rotates in only one direction in response to rotation of said platen in first and second directions.

5,009,533

PROPELLING PENCIL WITH CUSHION SLEEVE

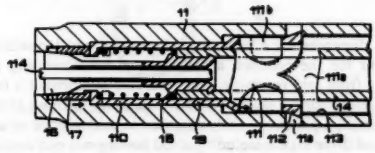
Hidehei Kageyama, Kawagoe, Japan, assignor to Kotobuki & Co., Ltd., Kyoto, Japan

Continuation of Ser. No. 346,344, Apr. 28, 1989, abandoned, which is a continuation of Ser. No. 695,755, Jan. 29, 1985, abandoned, which is a continuation of Ser. No. 410,963, Aug. 24, 1982, abandoned. This application Aug. 9, 1990, Ser. No. 565,214

Claims priority, application Japan, May 10, 1982, 57-67850

Int. Cl.[5] B43K *21/00, 21/22*

U.S. Cl. 401—65 **5 Claims**



1. A pencil comprising:

(a) an outer cylinder;

(b) a lead pipe accommodated in said outer cylinder and having a lead chuck at a distal end thereof;

(c) a chuck tightening pipe mounted in said outer cylinder and, in assembly, tightening said lead chick;

(d) an axially slidable cushion sleeve mounted in said outer cylinder and including:

(i) a first elongated portion, having a first outer diameter, adapted to engage said chuck tightening pipe,

(ii) a second elongated cushioning portion, having a second outer diameter, connected to said first elongated portion, said second elongated cushioning portion having a rear end remote from said first elongated portion,

(iii) an engaging projection extending radially outward of said second portion at said rear end,

(iv) a diametric slit formed in said rear end of said second portion and extending substantially transverse to said radially extending engaging projection, said diametric slit permitting radial resilient deflection of said rear end of said second portion in a direction substantially transverse to said diametric slit, and

(v) a circumferential hole formed in said second portion in front of said engaging projection, said circumferential hole permitting axial resilient deflection of said second portion, said slit, said hole and said second portion cooperating to form a resilient elastically deformable spring;

(e) said outer cylinder including engagement means for engaging said projection for limiting the axial movement of said cushion sleeve;

(f) said outer cylinder including guide means for guiding said at least one projection into engagement with said engagement means during assembly; and

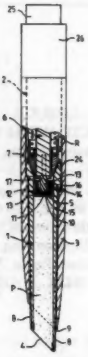
(g) spring biasing means interposed between said lead pipe and said first portion.

5,009,534

PISTON DISPENSER FOR PASTE OR SOLID PRODUCTS

Jean-Louis Gueret, Paris, France, assignor to L'Oreal, Paris, France

Filed Feb. 2, 1990, Ser. No. 474,525
Claims priority, application France, Feb. 7, 1989, 89 01545
Int. Cl.[5] B05C *17/00*; B45D *40/06*
U.S. Cl. 401—75 14 Claims



1. A dispenser for a product to be spread and including a reservoir for the product, a drive means for dispensing the product from said reservoir, said reservoir comprising a tube having a cylindrical interior and a dispensing opening at one end thereof, a piston movably disposed in said interior of said tube, said drive means including a rod having one end engageable with said piston, said piston having opposite faces and a passage extending therethrough from the one of said faces facing said reservoir to the other of said faces facing said rod, said passage being located in said piston so as to be in axial alignment with said rod and said rod having a head for engaging said other of said faces of said piston on which said passage opens, said rod being movable toward said piston to bring said head into engagement therewith to effect the dispensing and away from said piston thereby allowing separation of said rod from said piston.

5,009,535

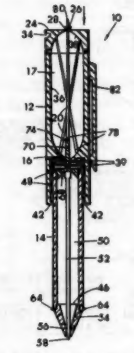
COMBINATION WRITING IMPLEMENT AND TOOTHPICK DISPENSER

Clayton D. Oilar, P.O. Box 64, Cedarville, Calif. 96104

Filed Aug. 10, 1990, Ser. No. 565,456
Int. Cl.[5] B43K *29/00*; B65D *83/02*
U.S. Cl. 401—195 1 Claim

1. A toothpick dispenser and writing implement combination, comprising:

an elongated tubular housing sized for hand held usage by a human, said tubular housing having a first end and an oppositely disposed second end, said first end having a plurality of toothpicks within a storage chamber of said tubular housing, said first end having means for dispensing a toothpick of said plurality of toothpicks, said means for dispensing a toothpick having means actuatable by pressing on a top of said first end whereby a single toothpick is dispensed from within said storage chamber through an aperture in said top of said first end, said tubular housing having spring biased means affixed thereto for temporarily retaining said tubular housing in a shirt pocket, said second end of said tubular housing having a writing tip, and means for temporarily covering said writing tip.



5,009,536

WATER BASE PIGMENT INK COMPOSITIONS FOR USE IN MARKING PENS

Hiroshi Inoue; Wataru Yokono, and Yasuji Okuda, all of Osaka, Japan, assignors to Sakura Color Products Corp., Osaka, Japan

Division of Ser. No. 434,945, Nov. 9, 1989, Pat. No. 4,942,185.
This application Jun. 8, 1990, Ser. No. 535,328
Claims priority, application Japan, Nov. 15, 1988, 63-288237
Int. Cl.[5] B43K *5/02*
U.S. Cl. 401—198 8 Claims

1. A marking pen which contains an absorbent ink reservoir impregnated with an ink composition and a pen tip connected thereto, the ink composition comprising:

(a) water in amounts of not less than 50% by weight;

(b) an aqueous emulsion of hollow resin particles in amounts of 0.5–40% by weight as solids;

(c) a white pigment in amounts of 1–40% by weight; and

(d) a water-solubilized alpha-methylstyrene/styrene/acrylic acid copolymer which has a weight average molecular weight of 1000–10,000 and a distribution of molecular weight of 0.5–3.3, but which contains substantially no components having a weight average molecular weight of not more than 500, in amounts of 0.1–30% by weight, based on the ink compositions, respectively.

5,009,537

BOOKLET BINDING SYSTEM

Philip B. Stengel, Cambridge, Minn., assignor to Creative Binding Systems, Inc., Cambridge, Minn.

Filed Dec. 27, 1988, Ser. No. 290,563
Int. Cl.[5] B42F *13/04*
U.S. Cl. 402—21 3 Claims

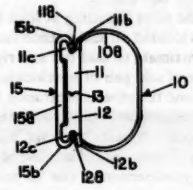
1. A booklet binding system for use with a wire loop binder of the type having a pair of opposed spaced apart rows of loop segments, wherein one of the segments forms narrow tine elements adapted to be received through the holes of prepunched sheets and the other segment being connecting loops to provide a continuous wire loop binder,

a closure removably mounted in the space between the two opposed loop segments to capture the sheets mounted on the tine elements of the wire loop binder,

said closure including a pair of spaced apart loop receiving grooves for respectively receiving the spaced apart ends of the two rows of loop segments,

means for retaining the closure in binding position between the ends of the loop segments, and wherein

the loop receiving grooves are orientated to alone slope inwardly to maintain the closure in interlocked binding



position between the two rows of loop segments, and wherein

the closure comprises a pair of elongated sections hingedly connected longitudinally thereof to facilitate insertion of the loop segments into the grooves defined therein.

5,009,538

BALL JOINT

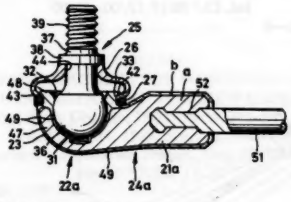
Tadayoshi Shirai, and Masahito Hioki, both of Hamamatsu, Japan, assignors to Ishikawa Tekko Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 12, 1990, Ser. No. 551,912

Claims priority, application Japan, Aug. 3, 1989, 1-201849

Int. Cl.[5] F16C *11/00*

U.S. Cl. 403—134 **5 Claims**



1. A ball joint comprising:

a housing portion;

said housing portion including an inner layer and an outer layer;

said inner layer including a fiber-reinforced plastic resin;

said outer layer substantially covering said inner layer;

said outer layer being a self-lubricating plastic resin substantially without fiber reinforcement;

a spherical inner chamber in said outer layer;

a hemi-spherical inner chamber in said inner layer;

an opening in said spherical inner chamber;

a ball stud;

a ball portion of said ball stud slidably mounted in said spherical inner chamber; and

a stud portion of said ball stud protruding from said opening.

5,009,539

CLAMPING SET WITH SCREW SLEEVE

Ralph Muellenberg, Im Wiesengrund 6, D-4048 Grevenbroich 12, Fed. Rep. of Germany

Filed Aug. 4, 1989, Ser. No. 389,890

Claims priority, application Fed. Rep. of Germany, Aug. 6, 1988, 3826849

Int. Cl.[5] B25G *3/20*

U.S. Cl. 403—370 **31 Claims**

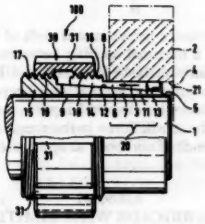
1. A clamping set for the transmission of torques between at least one inner shaft component having a cylindrical outer peripheral face and at least one outer hub component having a recess in which the inner component engages concentrically, and also having a cylindrical inner peripheral face, said clamping set comprising:

an outer taper bushing having a cylindrical outer peripheral face disposed to rest against the inner peripheral face of the outer component and an inner taper face coaxial with the outer peripheral face and having a taper angle lying in the self-locking region;

an inner taper bushing having a cylindrical inner peripheral face disposed to rest against the outer peripheral face of the inner component and an outer taper face coaxial with the inner peripheral face and having a taper angle equal to that of the inner taper face;

a screw sleeve which surrounds the inner taper bushing and is screwed with a first internal thread on an externally threaded extension of the inner taper bushing thereby connecting axially to a clamping region of the outer taper face; and

a longitudinal stop on the outer component engaging with the end of the inner taper bushing;



said screw sleeve being arranged axially outside a side portion of the outer component thereby drawing the taper bushings towards each other and pressing away from each other axially while gliding over the taper faces;

said outer taper bushing having an externally threaded extension connecting axially to the clamping region of the inner taper face, said outer taper bushing being arranged axially outside the side portion of the outer component;

said screw sleeve having a second internal thread of different pitch axially adjacent to the first internal thread;

the second internal thread of the screw sleeve engaging with the external thread of the outer taper bushing;

the externally threaded extension of the outer taper busing being disposed on a thin-walled end of the outer taper bushing and the threaded extension of the inner taper bushing being disposed on a thick-walled end of the inner taper bushing.

5,009,540

FASTENING MEANS

Vernon E. L. Nolan, 16 Gosse Road, Padbury, Western Australia, Australia

PCT No. PCT/AU87/00358, § 371 Date Apr. 25, 1989, § 102(e) Date Apr. 25, 1989, PCT Pub. No. WO88/03231, PCT Pub. Date May 5, 1988

PCT Filed Oct. 23, 1987, Ser. No. 348,669

Claims priority, application Australia, Oct. 27, 1986, PH8699

Int. Cl.[5] B25G *3/00*; A47H *13/00*

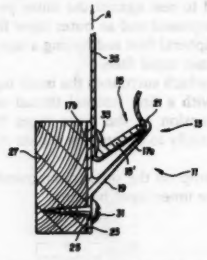
U.S. Cl. 403—405.1 **11 Claims**

1. A fastening means for fastening sheet material to a fixture wherein the sheet material is subject to a varying tensile force, comprising:

a fork member for mounting to the fixture, said fork member including a pair of outwardly diverging arms joined at a common junction, one of said arms including a hook means thereon spaced from said junction; and

means for fastening the sheet material within said fork member such that the fastening force applied to the sheet material is proportional to the tensile force in the sheet material, said means for fastening within said fork member

including a keeper member having a substantially planar body, said substantially planar body having two ends, one end for holding the sheet material against said hook means and an other end for holding the sheet material against the inner side of the other of said arms such that a fastening force is applied to the sheet material by said other end of said body in proportion to the tensile force in the sheet



material, a distance between said ends of said body being greater than a maximal spacing between said arms, and being less than a distance between said hook means and said common junction, so that said keeper may adopt a locking position wherein said keeper is pulled in the same direction as the tensile force in the sheet material, thereby causing said ends of said body to apply the fastening force.

5,009,541

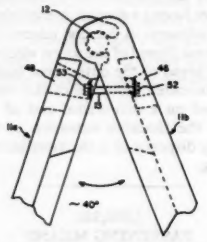
PLASTIC BARRICADE WITH LIMITING BOLT

Kurt W. Thurston, 475 Hill St., Reno, Nev. 89501

Continuation-in-part of Ser. No. 326,615, Mar. 21, 1989, abandoned, and a continuation of Ser. No. 383,298, Jul. 20, 1989. This application Jan. 25, 1990, Ser. No. 470,394

Int. Cl.[5] E01F *13/00, 15/00*

U.S. Cl. 404—6 **3 Claims**



1. A plastic barricade constructed from two substantially similar frame units each having a planar outside face and which are one piece, hollow, and integrally molded, such unit being hinged together to pivot around a common axis of rotation, each of said frame units having left and right edges when an outside face of said hinged barricade is directly viewed by an observer in front of the face of a freestanding barricade, the improvement comprising:

hinge means at the top of each of said frame units including near said left edge a cylindrical male boss and near said right edge a C-shaped female socket for snapping onto said male boss and freely pivoting thereon said hinge means normally allowing said two frame units to pivot open or unfold to an angle substantially greater than a predetermined angle used when placing said barricade in a freestanding position;

means for maintaining said barricade at said predetermined angle of said unfolded freestanding position, including for each frame unit a pair of recesses in said planar outside face near each one of said edges and below said hinge means each said recess having an aperture for accepting an elongated fastener having limiting means on both ends for abutting against said recesses when said barricade is unfolded to its predetermined angle said fastener having a length less than the distance between the planar outside faces of a folded barricade;

each of said frame units including at least one pair of interlocking means located on said outside face of each of said frame units proximate to said left and right edges of said frame unit, one of said pair of interlocking means being an indentation in and the other a protrusion from said outside face, said indentation and protrusion being dimensioned and shaped to closely mate together, said protrusion for each of said two frame units of said barricade always being located on a predetermined one of said left and right edges, whereby assuming the same lengthwise orientation of a barricade, one folded barricade may be stacked on another with the said interlocking means automatically mating with said planar faces of said frame units abutting each other, and without obstruction or interference by said fasteners.

5,009,542

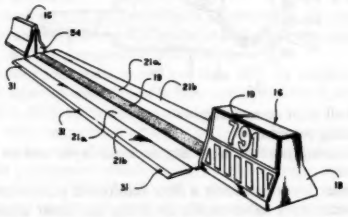
TRAFFIC BARRIER GATE

Paul W. Hardin, Jr., 3086 Parklane, Snellville, Ga. 30278, and Wayne Taylor, 5202 Vivid Dr., Stone Mountain, Ga. 30083

Filed Mar. 6, 1990, Ser. No. 489,346

Int. Cl.[5] E01F *13/00, 15/00*

U.S. Cl. 404—6 **11 Claims**



1. A traffic barrier for controlling the flow of vehicles comprising:

end walls flanking a vertically disposed and horizontally elongated movable gate, said gate being selectively movable vertically from an upright, closed position to an open substantially ground level position,

said gate having a first side and a second side, said sides being connected by a top member,

the first and second sides being pivotally connected to said top member,

a reinforcing longitudinal support beam extending from one end wall to the other end wall, said beam supporting the top member,

retractable support means extending from the support beam to ground level,

lifting means to effect vertical movement of said gate upon command,

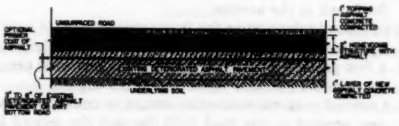
said first and second sides of said gate being adapted to move about said pivotal connection at the top member as the gate is moved to its lowered open position wherein said first and second sides collapse to substantially ground level to provide a ramp surface.

5,009,543

REINFORCED ASPHALT CONCRETE AND STRUCTURE FOR PRODUCING SAME

Jameel Ahmad, Forest Hills, and Joseph P. Valenza, Middle Village, both of N.Y., assignors to High Technologies, Inc., Forest Hills, N.Y.

Filed Jul. 25, 1989, Ser. No. 385,247
Int. Cl.[5] E01C *11/18*
U.S. Cl. 404—70 5 Claims



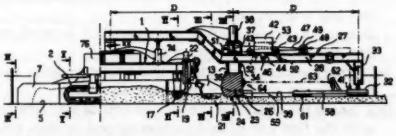
1. A pavement comprising a suitable base and a compacted asphalt concrete layer laid on said base to provide the surface of said pavement and a reinforcement structure positioned and embedded within said asphalt concrete layer below the top surface thereof, said reinforcement structure comprising a stiff, self-supporting reinforcement structure which compresses to about 83% of its original height, to the extent equivalent to that of unreinforced asphalt concrete, upon being compacted during road resurfacing when embedded in asphalt concrete laid on a road surface to reinforce the resulting compacted asphalt concrete, said reinforcement structure comprising open mesh wire strips configured and disposed relative to each other such that said strips are in side-by-side contact with each other and fixed together at locations of contact, the fixed contacting wire strips defining a plurality of cells or a honeycomb-like structure between said strips making up said reinforcement structure.

5,009,544

METHOD AND MACHINE FOR WORKING AN AREA OF GROUND, IN PARTICULAR FOR SURFACING A ROAD

Alain Chaize, 3 rue Greneta, 75003 Paris, France

Filed Aug. 14, 1989, Ser. No. 394,414
Claims priority, application France, Aug. 18, 1988, 88 10998
Int. Cl.[5] E01C *19/22*
U.S. Cl. 404—72 24 Claims



1. A method for working an area of ground, in which a machine carrying a tool (23) which is in contact with said area is displaced along the area to be worked while means (3, 38) at least indirectly supporting the tool (23) are adjusted in respect of height so that said tool follows a path which is substantially independent of the unevenness of a nonworked region (5) of the ground over which there progress means (2) for supporting said machine on rough ground located forwardly of a rear transverse end (26) of the tool (23), the tool being supported, during working, under a bridge frame, one front end of which is supported by the means (2) for supporting said machine on rough ground via an articulation (31) with an axis (X—X) transverse to the median longitudinal plane (P) of the machine, wherein a rear end of the bridge frame (27) is caused to rest on the worked area (39) under a pressure which is sufficiently low to avoid any significant deterioration of the worked surface (37), and wherein said pressure is adjusted by displacing a ballast (42) along the bridge frame (27).

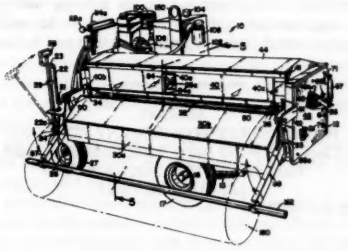
7. A method for working an area of ground, in which a machine carrying a tool (23) which is in contact with said area is displaced along the area to be worked while means (3, 38) at least indirectly supporting the tool (23) are adjusted in respect of height so that said tool follows a path which is substantially independent of the unevenness of a nonworked region (5) of the ground over which there progress means (2) for supporting the machine on rough ground which are located forwardly of a rear transverse end (26) of the tool (23), the tool being supported, during working, under a bridge frame one front end of which is supported by the means (2) for supporting the machine on rough ground via an articulation (31) with an axis (X—X) transverse to the median longitudinal plane (P) of the machine, wherein a rear end of the bridge frame (27) is caused to rest on the worked area (39) under a pressure which is sufficiently low to avoid any significant deterioration of the worked surface (39), and wherein said pressure is continuously detected and adjusted to maintain said pressure substantially constant.

5,009,545

WIRE MESH STRAIGHTENING METHOD AND APPARATUS

Darold D. Coleman, Rice Lake, and Raymond P. Nesseth, Barron, both of Wis., assignors to NTH, Inc., Barron, Wis.

Continuation of Ser. No. 316,155, Feb. 27, 1989, abandoned.
This application Jul. 20, 1990, Ser. No. 555,652
Int. Cl.[5] E01C *11/16, 24/04*
U.S. Cl. 404—100 29 Claims



1. Wire mesh straightening apparatus for automatically straightening rolled wire mesh at a construction site, comprising:

(a) a chassis sized and configured for ease of mobility to and at a construction site;

(b) a pair of generally parallel rollers mounted to said chassis and cooperatively aligned generally parallel to each other and forming a nip between those respective surface portions of said rollers that lie closest to one another at any point in time, said rollers having a length at least equal to the width of the wire mesh to be straightened;

(c) means for advancing the wire mesh to be straightened through said nip formed by said rollers including hydraulic drive means operatively connected to drive at least one of said rollers about its axis;

(d) reaction means connected to said chassis arranged and configured to intercept the wire mesh passing through said nip for continuously bending said mesh in a direction opposed to the preexisting curvature of said wire mesh as it leaves said nip; whereby said wire mesh is uniformly straightened as it leaves said reaction means; and

(e) self-releasing starting means connected to said chassis for retainably engaging the wire mesh to be straightened and for guiding the mesh toward said nip.

5,009,546

ROAD PAVER-FINISHER WITH A COMBINATION OF AXLES WITH STEERING WHEELS AND CRAWLER UNITS

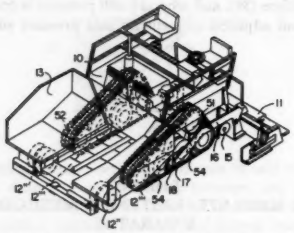
Domenico Domenighetti, Via Calli, 8, CH-6900, Switzerland, and Jack Layton, 4725 Turner Rd., SE., Salem, Oreg. 97301

PCT No. PCT/EP87/00197, § 371 Date Feb. 8, 1989, § 102(e) Date Feb. 8, 1989, PCT Pub. No. WO88/08054, PCT Pub. Date Oct. 20, 1988

PCT Filed Apr. 10, 1987, Ser. No. 299,826

Int. Cl.[5] E01C *19/18*

U.S. Cl. 404—110 **7 Claims**



1. A road paver-finisher comprising a tractor unit, a screed unit mounted for vertical movement on and relative to the tractor unit, the tractor unit having a hopper for road material, and conveyor means for unloading the road material from the hopper in front of the screed to be leveled by the screed, crawler belts mounted on the tractor unit forwardly of the screed for advancing the tractor unit, ground engaging steering wheels mounted on the tractor unit forwardly of the crawler belts, and power means for moving said steering wheels and crawler belts vertically relative to each other thereby to control tilting of the tractor unit and hence of the screed.

5,009,547

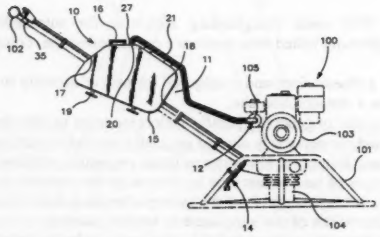
WATER SPRAY FOR CEMENT FINISHER

Jeff A. Clark, 225 W. El Norte #206, Escondido, Calif. 92026

Filed Jan. 11, 1990, Ser. No. 463,521

Int. Cl.[5] E01C *19/22*

U.S. Cl. 404—112 **5 Claims**



1. An improved apparatus for treating cement and other flooring surfaces having a frame, a handle on the frame, an internal combustion engine on the frame and a rotary finishing means to smooth the flooring surface on the frame powered by the engine, wherein the improvement comprises:

a. a fluid tank;

b. a filler cap on the fluid tank;

c. a control means connected to the fluid tank to control the flow of fluid from the fluid tank;

wherein the control means further comprises:

at least two control valves;

a linkage means attached to each control valve to open and close the control valve; and

an actuation means attached to each linkage means to move the linkage means;

d. at least two first inlet ports in the fluid tank through which the control means enters the fluid tank;

e. at least two outlet ports in the fluid tank through which the control means exits the fluid tank;

f. an first attachment means on the fluid tank to attach the fluid tank to the handle on the frame;

g. at least two nozzles to direct the flow of the fluid;

h. at least two fluid conduits to transmit the fluid from the fluid tank to the nozzles;

i. an second inlet port in the fluid tank;

j. a pressure conduit to transmit pressure to the fluid tank;

k. a first pressure connection means to connect the pressure conduit to an exhaust apparatus of the engine;

l. a second pressure connection means to connect the pressure conduit to the fluid tank through the second inlet port; and

m. a pressurization regulation valve connected to the pressure conduit.

5,009,548

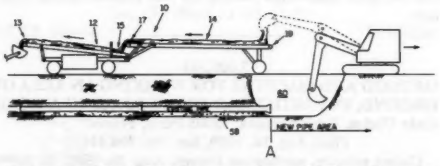
APPARATUS FOR AND A METHOD OF FACILITATING THE EXCAVATING AND REFILLING OF A TRENCH

G. P. "Sonny" Falbo, Rte. 3, Box 525 C, San Antonio, Tex. 78218, and Jesse W. Harris, 3006 Mayfair, San Antonio, Tex. 78217

Filed Jan. 26, 1990, Ser. No. 470,949

Int. Cl.[5] B65G *21/10*

U.S. Cl. 405—179 **3 Claims**



1. A method for aiding the excavation and filling of trenches in laterally confined spaces using an apparatus comprising;

a first longitudinal conveyer section and a second longitudinal conveyer section, each of said sections having a first end and a second end;

a first and a second endless conveyer belt located on said first and second conveyer section;

belt drive means for energizing said conveyor belts, said belt drive means capable of reversing direction;

link means for attaching the second end of said first section with the first end of said section second section, said link means further comprising pivot means for selectively allowing a straight or angled relationship between the longitudinal axis of said sections;

means for selectively positioning the linked ends of said sections, one above the other; and

truck means for steerably supporting said first and said second conveyer sections, said truck means having wheels and spaced sufficiently wide to straddle the trench:

the method comprising:

(a) removing virgin overburden for dumping at an off-site location by depositing overburden on the first end of the first conveyor unit for transportation to the second end of the second conveyor unit;

(b) removing overburden for depositing on the first end of the first conveyor unit which overburden will be dropped off the second end of the first conveyor unit into previously excavated trench which contains bedding and pipe, wherein steps (a) and (b) remove sufficient overburden to lay a section of pipe;

(c) adding bedding material by depositing it on the second end of the second unit for dropping into the trench

ultimately off the first end of the second unit and the first end of the first unit until sufficient bedding has been laid;

(d) laying a section of pipe;

(e) adding overburden from step (b) above in an amount sufficient to refill the trench;

wherein steps (a) through (e) are completed sequentially as the apparatus moves longitudinally in the direction of excavation until such a time as the excavation is complete.

5,009,549

EXPANSION ASSEMBLY FOR MINE ROOF BOLTS

John C. Stankus, Canonsburg, Pa., assignor to Jennmar Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 275,205, Nov. 22, 1988, Pat. No. 4,861,198. This application May 22, 1989, Ser. No. 363,274

The portion of the term of this patent subsequent to Aug. 29, 2006, has been disclaimed.

Int. Cl.[5] E21D *20/02*

U.S. Cl. 405—261 **10 Claims**

1. An expansion assembly for a mine roof bolt having a threaded portion at one end and a bolt head at the other end comprising;

a tapered plug having a body portion with a threaded internal bore adapted to be threaded onto said bolt threaded end portion, said tapered plug having two legs depending from said body portion that straddle said bolt and extend toward said bolt head when said plug is threaded onto said bolt threaded portion, said body portion and said depending legs forming continuous tapered surfaces that each form an angle of at least 8° to the axis of said bolt when said plug is threaded onto said bolt;

said tapered plug body portion having the surface positioned closer to said bolt threaded end formed with a relieved edge having a frusto-conical configuration to facilitate penetration of resin by said expansion assembly,

a pair of expansion leaves each having a serrated outer surface, a smooth inner surface and tapering edge surfaces joining said inner and outer surfaces, said expansion leaves each surrounding said bolt at a radially spaced distance from said bolt when said expansion assembly is positioned on said roof bolt, each of said leaf tapering edge surfaces being in abutting contact with said tapered plug tapered surfaces whereby said leaves are forced apart when said tapered plug is threaded axially onto said roof bolt and said leaves are restrained from axial movement relative to said roof bolt,

a metal bail connected to each of said expansion leaves and extending over the end of said roof bolt to prevent axial movement of said leaves relative to said bolt when said tapered plug is threaded onto said bolt threaded portion to force said leaves apart.

5,009,550

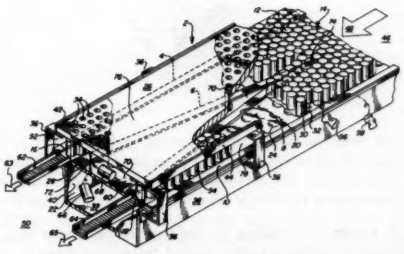
ARTICLE HANDLING DEVICE WITH LOW PROFILE SIDE GUIDES

Brian K. Hilbish, Beford; David W. Leonard, Sr., Lynchburg; Arnold C. Burgess, Madison Heights, and David R. Burns, Forest, all of Va., assignors to Simplimatic Engineering Company, Lynchburg, Va.

Filed Aug. 30, 1989, Ser. No. 400,523

Int. Cl.[5] B65G *47/256, 51/03*

U.S. Cl. 406—87 **26 Claims**



20. An improved can combiner for separating a stream of randomly oriented articles moving along an air conveyor path from an upstream to a downstream position into either right or left lanes, said articles having a generally uniform article height measured along a longitudinal axis of said articles and upstanding on said path with said longitudinal axis generally perpendicular to said path, said combiner comprising:

(a) an air conveyor deckplate having opposite lateral edges open to opposing sides of said deckplate with said conveyor path therebetween, said deckplate having a plurality of air jet orifices extending through said deckplate, said jets being oriented to propel said articles on said deckplate in a generally downstream direction, the number of said jets being at a predetermined value per unit area of deckplate;

(b) a plenum in pneumatic communication with said deckplate for being connected to a source of air under pressure to supply said air to said jets;

(c) a perforated cover mounted parallel to said deckplate above said deckplate at a vertical distance slightly greater than said article height, said cover restraining said articles against tipping over about said longitudinal axis;

(d) a first pair of elongated raised border members for establishing outer right and left boundaries for said path, said stops being mounted to said deckplate and extending longitudinally along the opposite lateral edges thereof in alignment with the direction of article flow;

(e) a second pair of right and left elongated raised divider members mounted to said deckplate between said border members, said divider members meeting at a point and extending in a downstream direction from said point at an acute angle to each other along at least a portion of said divider member lengths in the region of said point, the right divider member being spaced from said right border member to form said right lane therebetween and said left divider member being spaced from said left border member to form said left lane therebetween, whereby said articles encountering said point tend to separate into either the left or the right lane,

said border and divider members having a top wall portion spaced a preselected vertical distance from said deckplate that is high enough to deflect a majority of said articles to either side of said point and retain said articles within said lanes, but is low enough to permit some of aid articles to fall across said members to be thereby expelled out of said air conveyor.

5,009,551

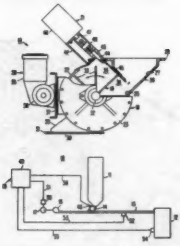
MATERIAL HANDLING SYSTEM AND CONTROL VALVE THEREFOR

Roy Swartz, Muncy, Pa., assignor to Delaware Investments Corp., Wilmington, Del.

Division of Ser. No. 192,916, May 12, 1988, abandoned. This application Jun. 26, 1989, Ser. No. 371,979

Int. Cl.[5] B65G *53/46*

U.S. Cl. 406—128 **14 Claims**



1. A system for handling particulate material comprising:

means for holding a supply of said particulate material;

means for receiving said particulate material;

means for pneumatically conveying said particulate material from said holding means to said receiving means;

means operatively connected to said pneumatic conveying means for inducing fluid flow therein;

a rotary valve operatively interconnected between said material holding means and said pneumatic conveying means for gravity feeding said material from said material holding means to said pneumatic conveying means, said rotary valve comprising a housing having a rotor chamber, a rotor journaled in said housing having a plurality of circumferentially spaced pockets for receiving said material, means for rotating said rotor, said rotor chamber having an inlet communicating with said material holding means and an outlet communicating with said pneumatic conveying means whereby material in said holding means will gravity flow through said inlet into said rotary pockets, to be carried through said rotor chamber and discharged through said outlet into said pneumatic conveying means, a slide valve disposed in said inlet for controlling the flow of material therethrough, and means for electrically operating said slide valve;

means for sensing operating conditions of said system; and

remote control means connected and responsive to said sensing means and electrically connected to said slide valve operating means for automatic operation of said slide valve in response to sensed conditions.

5,009,552

WEAR RESISTANT GRAIN FLOW CONTROL ELBOW

James G. Talcott, P. O. Box 2493, Great Falls, Mont. 59403

Filed Mar. 12, 1990, Ser. No. 493,492

Int. Cl.[5] B65G *53/52*

U.S. Cl. 406—193 **2 Claims**

1. A flow control elbow for changing direction of particulate matter flowing in a stream, the flow control elbow comprising:

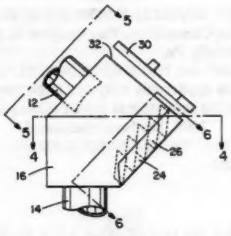
an entrance spout through which the stream of particulate matter may flow;

a discharge spout through which the stream of particulate matter may flow;

a chamber having a first opening in fluid communication with the entrance spout and a second opening in fluid communication with the discharge spout; the chamber further providing a path for the particulate matter to travel from the entrance spout to the discharge spout;

the entrance spout being positioned above the discharge spout and being further positioned with the direction of stream flow through the entrance spout at an angle 90° or greater with the direction of stream flow through the discharge spout;

a baffle-support plate provided within the chamber in the path of the particulate matter through the chamber, the baffle-support plate being positioned to provide an inclined surface extending from one side of the second opening upwardly and generally perpendicular to the stream flow through the entrance spout;



a baffle secured to the baffle-support plate, the baffle extending upwardly from the baffle plate and sized to provide clearance between the top of the baffle and an opposing wall of the chamber;

the baffle including two members formed in a "V"-shaped pattern with the apex of the "V"-shaped pattern positioned closer the second opening than the free ends of the "V"-shaped pattern;

the baffle further having the apex broken away to permit grain flow from above the baffle to the discharge spout.

5,009,553

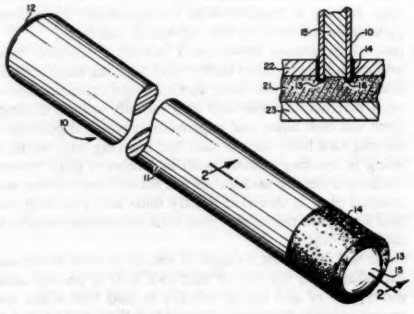
METHOD AND APPARATUS FOR DRILLING HARDPLATE

William G. Nowman, P.O. Box 2082, Camp Verde, Ariz. 86322

Continuation-in-part of Ser. No. 75,515, Jul. 20, 1987, abandoned. This application Jun. 9, 1989, Ser. No. 364,268

Int. Cl.[5] B23B *27/10*

U.S. Cl. 408—1 R **2 Claims**



2. In a method for drilling a hole in the hardplate of a bur-

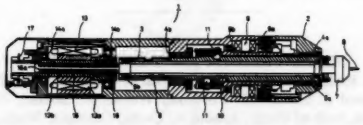
glar-resistant safe, the step of rotating a diamond-tipped drill bit in said hardplate with a composition consisting essentially of beeswax in the drilling interface.

5,009,554

MACHINE TOOL

Fumio Kameyama, Nagoya, and Chikamasa Hattori, Ichinomiya, both of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Sep. 4, 1990, Ser. No. 577,125
Claims priority, application Japan, Sep. 9, 1989, 1-234032
Int. Cl.[5] B23C *1/06*; B23B *47/06*
U.S. Cl. 409—231 19 Claims



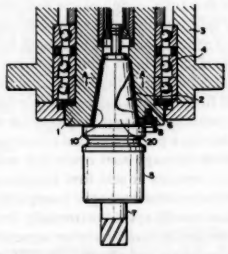
1. A machine tool for machining a work piece, comprising:
a housing;
a spindle having a first end supported within the housing such that the spindle rotates about an axis of the spindle and reciprocates along the spindle axis;
a tool attached to a second end of the spindle;
a feed motor installed in the housing for reciprocating the spindle along the spindle axis;
a variable reluctance motor installed in the housing for rotating the spindle about the spindle axis; and
synchronous control means for controlling the feed motor and variable reluctance motor.

5,009,555

TOOL HOLDER FOR MACHINE TOOL

Koichiro Kitamura, Toyama, Japan, assignor to Kitamura Machinery Co., Ltd., Toyama, Japan

Filed Mar. 13, 1989, Ser. No. 322,125
Claims priority, application Japan, Mar. 25, 1988, 63-69256
Int. Cl.[5] B23B *31/04*
U.S. Cl. 409—232 10 Claims



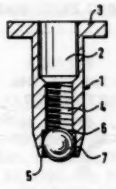
1. A machine tool comprising a machine tool body, a spindle rotatably supported by the machine tool body, the spindle having a supporting portion, a tool holder having an inserting portion to be attached to the supporting portion, a protecting layer fixed to the supporting portion for covering the supporting portion, said tool holder having a coating layer formed on the inserting portion thereof, the coating layer being made of a titanium compound selected from the group consisting of TiN, TiC and TiCN, the protecting layer being made of a ceramic material.

5,009,556

BLIND RIVETING NUT

Herbert Schruff, Reischelplatz 7, 5559 Föhren, Fed. Rep. of Germany

Filed May 15, 1989, Ser. No. 351,960
Int. Cl.[5] F16B *13/04*
U.S. Cl. 411—15 4 Claims



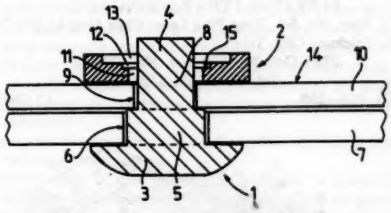
1. A blind riveting nut comprising a hollow shank portion having first and second ends, a setting head at the first end, an internal screwthread at least adjacent the second end, for receiving the pulling mandrel of a blind rivet setting tool and a closure element disposed at the second end of the shank portion, said closure element comprising a closure ball which is press fitted into said second end of the shank portion, said closure ball being separate from and completely removable from its closure portion of closing the shank portion at said second end thereof.

5,009,557

ASSEMBLY DEVICE AND PROCESSES OF USING SAID DEVICE

Charles Dessirier, Bouclans, France, assignor to Bost S.A., Laissey, France

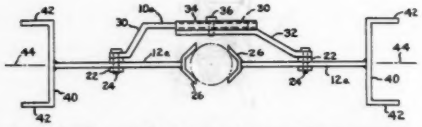
Filed Mar. 20, 1990, Ser. No. 496,022
Claims priority, application France, Mar. 20, 1989, 89 03957
Int. Cl.[5] F16B *19/06*
U.S. Cl. 411—504 5 Claims



1. An assembly device for permanently joining at least two parts, comprising:
a rivet element having a head and a rod formed of a material which is deformable by compression; and
a washer having an opening through which said rod extends when said rivet element is assembled to the parts to be joined with said head abutting a first one of the parts and said rod extending through the parts to be joined,
wherein a volume of said opening is at least equal to a volume of said rod projecting from the parts to be joined when said rivet element is assembled to the parts to be joined with said head abutting the first of the parts,
wherein the walls of said washer defining said opening have a lateral shoulder, and
wherein said opening comprises three coaxial cylindrical bores having progressively increasing diameters in a direction away from the rivet head when the rivet element is assembled to the parts to be joined, and wherein the volume of the two bores closest to the rivet head is substantially equal to the volume of said rod projecting from

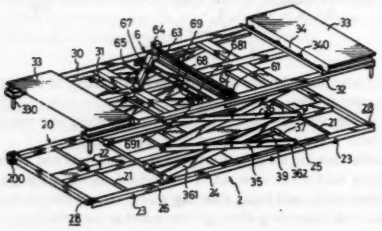
the parts to be joined when said rivet element is assembled to the parts to be joined.

5,009,558
TREE LIFTER
Emilio Savedra, Jr., 426 Charleston NE., Albuquerque, N. Mex. 87108
Filed Nov. 16, 1989, Ser. No. 437,113
Int. Cl.[5] A01G *23/02*; B66F *11/00*
U.S. Cl. 414—23 4 Claims



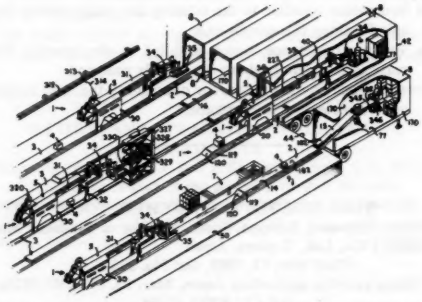
1. A mechanism for lifting and manually transporting an upstanding tree, comprising a horizontally elongated support frame adapted for horizontal disposition alongside a tree to be lifted, said frame having a longitudinal axis and a transverse axis; two similarly-constructed elongated handles, each having a manually-grippable end and a free end; the free ends of the handles being relatively close together, and the manually-grippable ends of the handles being spaced relatively far apart; a transverse horizontal-axis pivot means connecting each elongated handle to the support frame, whereby each elongated handle can be manually swung in a vertical plane paralleling the frame longitudinal axis; each pivot means being located at approximately the longitudinal midpoint of the associated handle, said pivot means being spaced apart along the longitudinal axis of the support frame such that the handles have their free ends in confronting relation to a standing tree; and a tree-engageable saddle carried on the free end of each handle, whereby the weight of the engaged tree exerts wedge forces on the portions of the handles between the saddles and the respective pivot means.

5,009,559
ELEVATOR TYPE PARKING LOT
Chyi J. Tsay, No. 5-1, Tung Ping Lane, Chen Ping Li, Pei Tun Chu, Taichung City, Taiwan
Filed Oct. 30, 1989, Ser. No. 428,872
Int. Cl.[5] E04H *6/00*
U.S. Cl. 414—259 12 Claims



1. An elevator type parking lot comprising:
a plurality of layers of main frames, each layer including a passage longitudinally provided on a center of a bottom surface thereof, at least one layer of holding units being provided along each side of said passage, each holding unit including a pair of upper tracks and a pair of lower tracks;
an elevator slidable vertically to align with each layer of said main frames;
a sliding conveyer being raised and carried by said elevator, said sliding conveyer being slidable on a bottom surface of said elevator and slidable along said passage of each layer of said main frames so as to align with each holding unit, said sliding conveyer including a lower frame and an upper frame connected together by a lifting mechanism, said lifting mechanism being extendible vertically so as to raise said upper frame, and a cross slide feed mechanism being provided upon said upper frame; and
a sliding carrier being comprised of substantially a plate and being carried on said upper frame of said sliding conveyer, said sliding carrier being raised by said lifting mechanism to align with either said pair of upper tracks or said pair of lower tracks of each said holding unit, said sliding carrier being actuated to move laterally by said cross slide feed mechanism to either said pair of upper tracks or said pair of lower tracks, said sliding carrier being held on said pair of upper tracks of each said holding unit when carrying a motor vehicle and being held on said pair of lower tracks when carrying no vehicle.

5,009,560
MIXED FREIGHT HANDLING SYSTEM
Carl J. Ruder; Ronald J. Haney, both of Oveland Park, Kans.; Richard J. Chutorash, Portland; Wayne W. Bostad, Forest Grove, both of Oreg.; Arnold A. Zweig, Olympia, Wash., and Lyle B. Payne, Stilwell, Kans., assignors to Yellow Freight System, Inc., Overland Park, Kans.
Filed Dec. 6, 1988, Ser. No. 280,720
Int. Cl.[5] B65G *1/06, 67/02*
U.S. Cl. 414—392 27 Claims



1. An article handling system for transferring articles between spaced apart first and second locations, said second location being within the article receiving, elongated, open end interior of an article transporting vehicle and said first location being external of said interior, said system comprising:
(a) an elongated article conveyor including means forming a support surface capable of simultaneously supporting a moving succession of articles, said conveyor being positioned at said first location and extendible from a retracted condition substantially at said first location to an extended condition wherein a portion of said conveyor invades said second location through said open end and a portion of said conveyor remains at said first location; and
(b) an article manipulator having a manipulating portion, a chassis portion spaced apart horizontally from said manipulating portion and a boom member structurally connecting said manipulating and chassis portions, said manipulator being extendible independently of said conveyor from a retracted condition substantially at said first location and an extended condition wherein said manipulating portion invades said second location through said open end and said chassis portion remains at said first location but connected to said manipulating portion by said boom member, said manipulator being at least in part spaced from said conveyor such that an article moving on said conveyor is tranferable on said conveyor between said locations past said manipulator, said manipulator and said

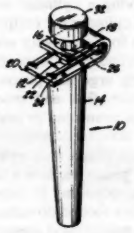
conveyor being both adapted to simultaneously extend generally horizontally from said first location a substantially equal extent through said open end into said second location when in said respective extended conditions.

5,009,561

REAGENT TABLET DISPENSER

Paul A. Lombardino, Warren; Ronald L. Saxon, Stephensburg, and Dennis W. Supchak, Bloomfield, all of N.J., assignors to Pharmacia Diagnostics Inc., Fairfield, N.J.

Filed Aug. 18, 1989, Ser. No. 395,608
Int. Cl.[5] B65D *83/04*
U.S. Cl. 414—412 27 Claims



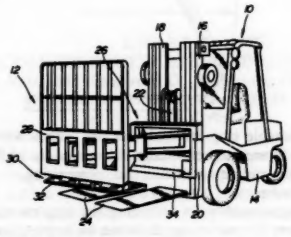
1. A tablet dispenser which dispenses a tablet from a package which has two layers of packaging material which comprises
(a) a top shaft;
(b) a thumb piece in which an anular hollow inclined blade having a retracted portion is engaged, said thumb piece being slidably mounted on said shaft, and said blade being adapted to penetrate a generally flat package placed below the blade and to release a tablet from said package while said retracted portion leaves an incompletely cut out hole in both sides of said package;
(c) a plate having a hole adapted to allow the blade to pass therethrough, said plate being connected to the top shaft by a support member;
(d) a bottom shaft extending underneath the hole and in line with the cutting blade and top shaft, said bottom shaft being connected to the plate; and
(e) means for holding a package containing a tablet on top of the plate so that the package can be positioned in order to align the tablet over the hole and in the path of the blade.

5,009,562

CONTROL FOR LOAD CARRIER OF LIFT TRUCK

Takashi Hosotani, Kawasaki, and Kiyoshi Inoue, Tokyo, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Dec. 23, 1987, Ser. No. 137,292
Claims priority, application Japan, Dec. 23, 1986, 61-306800; Apr. 20, 1987, 62-96930; Apr. 20, 1987, 62-96931; Apr. 20, 1987, 62-96932; Apr. 24, 1987, 62-101629
Int. Cl.[5] B60P *1/00*
U.S. Cl. 414—440 13 Claims



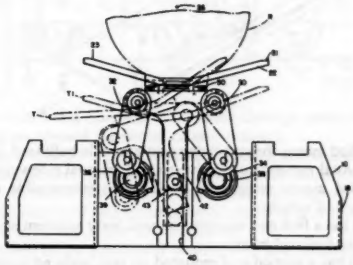
1. A lift vehicle comprising:
a roller;
means for rotating said roller at a rotation rate substantially proportional to a ground velocity at which said vehicle moves;
a hydraulic circuit including a hydraulic regulator for providing hydraulic fluid at a rate substantially proportional to said rotation rate at which said roller rotates, wherein said hydraulic regulator is mechanically connected to said roller and driven thereby; and
a hydraulic actuator operated by said hydraulic fluid.

5,009,563

MOBILE VEHICLE AND METHOD FOR HANDLING PAPER ROLLS

Marvin L. Case, Aberdeen; Robert E. Sturm, Hoquiam, and David P. Herigstad, Aberdeen, all of Wash., assignors to Haines & Emerson, Inc., Hoquiam, Wash.

Filed Jun. 14, 1989, Ser. No. 366,880
Int. Cl.[5] B60P *3/00*
U.S. Cl. 414—470 6 Claims



1. A mobile vehicle for handling large cylindrical paper rolls, comprising:
a roll support cradle on a main frame, said cradle having a central recess formed by upwardly and outwardly diverging opposite elongated leaves for supporting and guiding a cylindrical roll to roll along the leaves and center itself in the central recess of the cradle when lying on the cradle with the roll's central longitudinal axis horizontal;
said main frame having a central cradle support track for pivotally supporting said cradle and limiting the cradle's movement with respect to the track to vertical and pivotal movement;
means for manipulating the cradle so that the leaves can be raised or lowered; and
wherein each of said leaves can be raised or lowered in different directions relative to each other and on opposite sides of said central support track for tilting the cradle and thereby rolling a paper roll onto or cut of the cradle central recess from either lateral direction relative to said central support track, and the leaves of the cradle can be moved laterally with respect to the central support track by the pivoting of the cradle about a horizontal axis.

5,009,564

CARGO CARRYING VEHICLE HAVING A MOVABLE BULKHEAD LOCATED THEREIN

David E. Lutz, and David W. Lutz, both of P.O. Box 810, Carlisle, Pa. 17013

Filed Oct. 2, 1989, Ser. No. 415,719
Int. Cl.[5] B60P *1/00*
U.S. Cl. 414—510 31 Claims

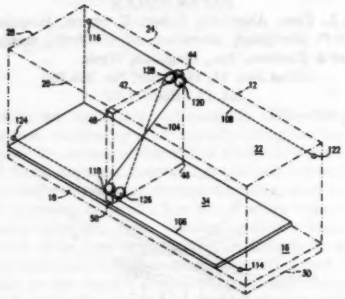
20. A cargo carrying vehicle comprising:
(a) a body having an interior, an internal floor, a left internal sidewall, a right internal sidewall, a longitudinal axis, a front end, and a rear end;
(b) at least one movable support surface mounted on said

internal floor for movement relative thereto, said movable support surface having a front end and a rear end;

(c) first means for moving said movable support surface back and forth between a first position and a second position spaced longitudinally from said first position towards said rear end of said body;

(d) a movable bulkhead mounted in said interior above said movable support surface for movement relative to said internal floor;

(e) second means for moving said movable bulkhead back and forth between a first position and a second position spaced longitudinally from said first position towards said rear end of said body; and



(f) third means for stabilizing said movable bulkhead against pivotal movement relative to said internal sidewalls, said third means comprising at last two inextensible cables each of which:

(i) has a first end mounted on said body adjacent said rear end of said body;

(ii) has a second end mounted on said body adjacent said front end of said body;

(iii) passes through said movable bulkhead but is not attached to said movable bulkhead; and

(iv) prevents pivotal movement of said movable bulkhead about one axis.

5,009,565

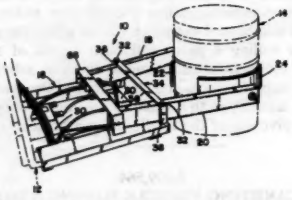
FORK LIFT ATTACHMENT

LaVerne Esau, Hillsboro, Kans., assignor to Liberty Diversified Industries, Inc., Minneapolis, Minn.

Filed Nov. 20, 1989, Ser. No. 439,551

Int. Cl.[5] B65G *65/34*

U.S. Cl. 414—607 **4 Claims**



1. An attachment for a fork lift comprising:

a frame having attachment means for attaching said frame to the forks of a fork lift;

first and second pivot arms, each of said pivot arms extending from a proximal end to a distal end;

means for pivotally connecting said pivot arms to said frame for said distal ends to move toward and away from one another in first predetermined plane;

first and second clamp means carried on said distal ends of said first and second pivot arms, respectively;

means for rotatably connecting said clamp means to said distal ends for said clamp means to rotate in a second predetermined plane generally perpendicular to said first predetermined plane;

arm motion control means for selectively urging said distal ends toward and away from one another, and for said arms to pivot between first and second positions with said arms in said first position spaced apart for said clamps to receive a drum of predetermined dimensions, and with said arms in said second positions disposed for said clamps to be urged against said drum;

clamp motion control means for selectively rotating said clamps in any one of at least two rotational directions, said clamp motion control means including first and second fluid pressure actuators associated with said first and second clamp means, respectively; each of said fluid pressure actuators having a cylinder and a piston head disposed within said cylinder for reciprocating motion, master control means for selectively admitting a fluid under pressure to said cylinders on opposite sides of said piston heads to selectively urge said piston heads to reciprocate within said cylinder, first and second sets of first and second piston rods connected to said piston heads of said first and second actuators, respectively, for movement therewith, said first piston rods extending in response to movement of said piston heads in a first direction and said second piston rods extending in response to movement of said piston heads in a second direction, said master control means including a master fluid pressure actuator for simultaneously urging piston heads of said first and second actuators; and

linkage means for linking said first and second sets of first and second piston rods to said first and second clamp means, respectively for said clamp means to rotate in a first direction when said first piston rods extend, and to rotate in a second direction when said second piston rods extend.

5,009,566

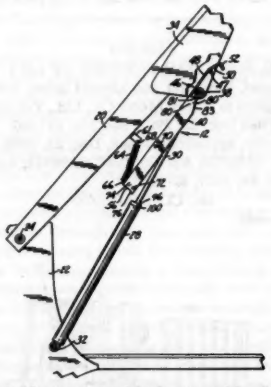
RETRACTABLE BOOM STOP

James E. Asche, Milnor, N. Dak., assignor to Clark Equipment Company, Milnor, N. Dak.

Filed Oct. 20, 1989, Ser. No. 425,648

Int. Cl.[5] B66C *23/00*; E02F *3/80*

U.S. Cl. 414—722 **20 Claims**



1. A retractable stop assembly for use with a boom arm of the type configured to be raised and lowered by a lift cylinder having a body and an extensible rod, comprising:

a stop member;

a mounting assembly for attaching the stop member to the boom arm for movement between an inoperative position adjacent the boom arm and an operative position in which

the stop member is engaged between a segment of the boom arm and a forward end of the lift cylinder body for preventing retraction of the lift cylinder; and,

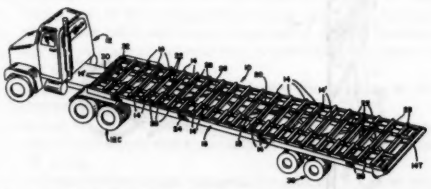
a biasing mechanism releasably securable between the boom arm and stop member for moving the stop member from the operative position to the inoperative position in response to an extension of the lift cylinder.

5,009,567

TRAILER AND TRAILER UNLOADING SYSTEM

E. Dale Fenton, 1325 Smiley La., Columbia, Mo. 65202

Division of Ser. No. 908,821, Sep. 18, 1986, Pat. No. 4,806,061.
This application Feb. 2, 1989, Ser. No. 305,062
Int. Cl.[5] B60P *1/04*
U.S. Cl. 414—786 **6 Claims**



1. A method for unloading a large load from a long bed trailer onto a flat area of ground using a prime mover as its sole source of power, wherein the trailer's bed is connected to the prime mover at one end by a connection which allows it to pivot downward at the connection from a position with its tail end is well off of the ground and maintains the bed at the connection to the prime mover, a substantially fixed height above the ground as the prime mover moves over the ground to a position wherein the tail end is just off of the ground, and said trailer bed has a wheeled carriage having brakes separately controlled from the prime mover which is mounted at its bottom so as to move longitudinally from a position wherein it supports the trailer with its tail end well off of the ground to a position wherein the tail end is just off of the ground, comprising the steps of

(a) lowering the tail end of the bed by applying the brakes to the wheeled carriage and moving the prime mover and the trailer bed relative thereto and without the use of any other powered devices and without articulating the trailer bed between the connection to the prime mover and the carriage;

(b) removing any securing devices from between the load and the trailer;

(c) advancing the trailer and the bed, with the tail end down out from under the load, so that it falls to the ground off of the tail of the bed; and

(d) raising the tail end of the bed by reapplying the brakes to the wheeled carriage while moving the prime mover and the bed relative thereto and without the use of any other powered devices and without articulating the trailer bed between the connection to the prime mover and the carriage.

5,009,568

WAVE ACTUATED POWER GENERATING APPARATUS

George S. Bell, 1365 Kingswood Ct., Ft. Myers, Fla. 33919

Filed Jul. 11, 1990, Ser. No. 551,144
Int. Cl.[5] F03B *13/12*
U.S. Cl. 415—3.1 **8 Claims**

1. A wave-actuated power generating apparatus comprising:

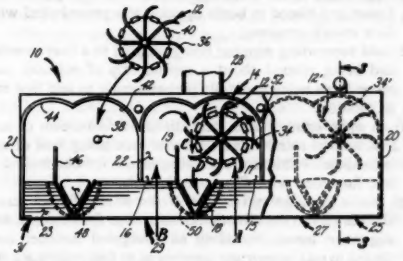
an impulse-type water turbine having a plurality of blades each with a facing and a following surface and operably mounted for rotation within a housing onto an upright output shaft about a hub for use;

said housing having a back panel, opposing sides and opposing lower and upper panels, said lower and upper panels in close proximity to the upper and lower edges of said water turbine;

said sides and lower and upper panels extending to form an inlet nozzle which faces oncoming waves;

a wave splitter positioned centrally within said inlet nozzle forming a first and second inlet nozzle portion structured to separate each oncoming wave so that a first and second portion of each wave passes through said first and second inlet nozzle portions, respectively and into said housing;

said first wave portion passing through said first water nozzle portion striking said facing surfaces of said water turbine blades before contacting said housing back panel



while being reversed in direction through about 180 degrees toward the center of said housing;

said second wave portion passing through said second water nozzle portion striking said housing back panel and being reversed in direction through about 180 degrees toward the center of said housing before striking said facing surfaces of said water turbine blades;

a water outlet positioned centrally in said housing lower panel behind said wave splitter for downwardly discharging water entering said inlet nozzle after rotationally acting upon said water turbine;

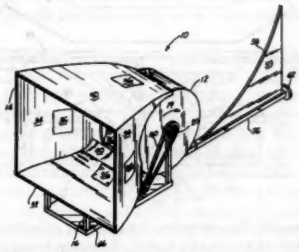
said housing lower surface positioned generally at mean water level.

5,009,569

WIND ENERGY COLLECTION SYSTEM

Francis N. Hector, Sr., and Francis N. Hector, Jr., both of P.O. Box 81024, Las Vegas, Nev. 89180

Filed Jul. 21, 1989, Ser. No. 382,908
Int. Cl.[5] F03B *15/06*
U.S. Cl. 415—4.1 **7 Claims**



1. A wind-driven apparatus for generating rotational mechanical energy from a wind flow stream comprising:

(a) a closed rotatable cylinder journeled to a supporting member and having a first axis of rotation;

(b) a plurality of closed elongated vanes positioned about the entire circumference of and secured to said cylinder and oriented parallel to said first axis of rotation, each of said vanes curving outwardly away from said cylinder and

meeting at adjacent ends thereof, thereby forming concave adjacent wind impingement areas circumferentially about said cylinder, thereby preventing the flow of said wind stream past said cylinder;

(c) an intake funnel secured to said supporting means and configured to converge on said closed rotatable cylinder to collect and direct said wind flow stream towards said vanes, said funnel having top, bottom and side walls and being open at the front, said walls of said funnel converging irregularly to direct said wind flow stream to said wind impingement areas, said top wall of said intake funnel terminating downstream of said horizontal axis of rotation and said bottom wall terminating upstream of said horizontal axis of rotation;

(d) a plurality of blow-through panels forming a part of said funnel and biased to begin opening at a pre-selected wind flow stream pressure;

(e) said supporting member being secured to a base member and being pivotal about a second axis of rotation, said second axis being generally perpendicular to said first axis of rotation;

(f) an open exhaust area immediately downstream of said first axis of rotation, said exhaust area being free of any immediate obstruction and other means for channeling of said funnelled wind flow stream; and,

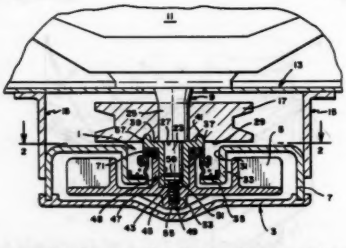
(g) means for aligning said open front of said funnel generally parallel to the direction of said wind flow stream, said alignment means including an elongated member connected to said supporting member at its first proximate end and elongated in the direction of said wind flow stream to a second distal end having means for allowing the pivoting of said supporting member about said second axis of rotation, said means for allowing pivoting comprising a wheel member mounted at said distal end of said elongated member and confined to motion along a pre-determined arcuate track; and, a second vane member mounted to and depending vertically upwardly from said elongated member, said second vane member increasing in vertical extent from said proximate end to said distal end of said elongated member.

5,009,570

MOUNTING ASSEMBLY FOR THE IMPELLER OF A FLUID PUMP

Curtis G. Richardson, Energy, Ill., assignor to Maytag Corporation, Newton, Iowa

Filed May 2, 1989, Ser. No. 346,584
Int. Cl.[5] F04D *29/10*
U.S. Cl. 415—174.2 **16 Claims**



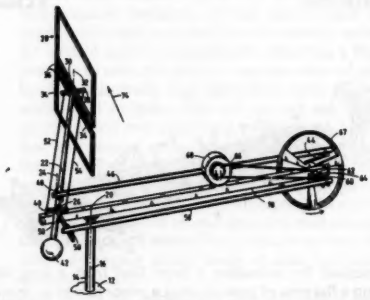
1. An assembly for mounting the impeller of a fluid pump to the drive shaft of an electric motor, the pump being of the type including an impeller disposed for rotation within a stationary housing for pressurizing fluid through an inlet and an outlet of the housing and a resilient seal assembly for preventing fluid leakage from the housing, the improvement comprising the resilient seal assembly being disposed to urge the impeller in a direction towards the drive shaft of the motor for providing end thrust force to axially locate and maintain the impeller on the drive shaft, a sleeve slidably secured on the end of the drive shaft, the impeller being attached to the sleeve and the seal assembly being disposed between the sleeve and the housing.

5,009,571

WIND MOTOR

Raoul D. Smith, Lompoc, Calif., assignor to Aeolian Partnership, Camarillo, Calif.

PCT No. PCT/US89/00326, § 371 Date Dec. 28, 1989, § 102(e) Date Dec. 28, 1989
PCT Filed Jan. 26, 1989, Ser. No. 460,832
Int. Cl.[5] F03D *5/06*
U.S. Cl. 416—79 **13 Claims**



1. Apparatus for use in a wind motor, comprising in combination:

a base;

an arm oriented at an angle θ with respect to said base;

means for mounting said arm to said base for pivotal motion with respect to said base about a first axis that is perpendicular to said arm;

a sail having a center of pressure and oriented at an angle α with respect to said base;

means for mounting said sail to said arm for pivotal motion with respect to said arm about a second axis parallel to but displaced from the first axis, said second axis passing through the center of pressure of said sail; and

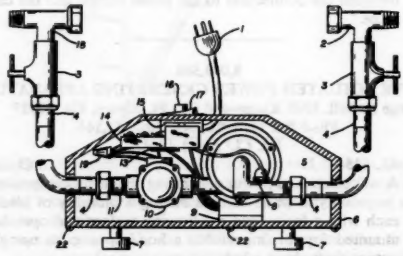
coupling means interconnected between said base and said sail for producing a reciprocating motion of said arm with respect to said base by continuously altering the angle α of said sail with respect to said base.

5,009,572

WATER CONSERVATION DEVICE

Ray Imhoff, 1824 Arlington Ave., El Cerrito, Calif. 94530, and Sadraddin Seif, 933 Lorna St., Corona, Calif. 91720

Filed Oct. 16, 1989, Ser. No. 422,247
Int. Cl.[5] F04B *49/00*
U.S. Cl. 417—32 **5 Claims**



1. An improved water conservation device which may be

installed in conjunction with existing and non-existing plumbing systems and fixtures having a source of pressurized water, a hot water supply line, a cold water supply line, a hot water heater, and outlet fixtures coupled to the hot and cold water supply lines, said device comprising:

a first tee fitting adapted for coupling to said hot water supply line;

a second tee fitting adapted for coupling to said cold water supply line;

a hot water supply line shut-off valve adapted for coupling to said first tee fitting;

a cold water supply line shut-off valve adapted for coupling to said second tee fitting;

an electrically controlled pump having an outlet port and an inlet port;

a first water line adapted for coupling to said hot water supply line shut-off valve and to said inlet port of said pump;

a solenoid valve having an input port connected to said outlet port of said pump for allowing mixture of hot and cold water while said pump is operating, and for preventing the mixture of hot and cold water when said pump is not operating;

a nipple fitting having one end adapted for coupling to the output end of said solenoid valve;

a second water line adapted for coupling to remaining open end of said nipple and to said cold water supply line shut-off valve;

an adjustable thermostat temperature selector for detecting the hot water temperature of said inlet of said pump;

a thermostat switch for energizing said solenoid valve and said pump;

a removable housing structure; and

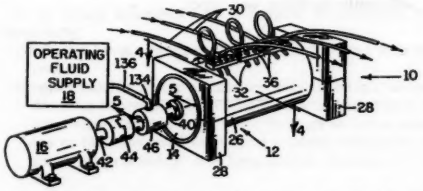
an indicator light for informing the user that the selected water temperature has been achieved.

5,009,573

VARIABLE OCCLUSION PERISTALTIC APPARATUS AND METHOD

Gregg Ring, Sr., Houston, and Daniel C. Soper, Buda, both of Tex., assignors to Randolph Austin Company, Inc., Manchaca, Tex.

Filed Aug. 18, 1989, Ser. No. 395,940
Int. Cl.[5] F04B *43/12*
U.S. Cl. 417—53 **18 Claims**



1. A variable occlusion peristaltic apparatus comprising:

A. a housing;

B. an occlusion track being defined in the housing and including a generally arcuate reactive surface, the occlusion track being adapted to receive a loop of tubing extending into the housing through a tubing inlet and exiting the housing through a tubing outlet;

C. a rotor rotatably mounted within the housing and adapted for rotation about a device rotational axis;

D. a rotating machine having a drive shaft connected to the rotor for rotation therewith;

E. a plurality of carriage passageways positioned in the rotor and extending outwardly from the device rotational axis at different angular orientations therefrom toward the arcuate reactive surface of the occlusion track;

F. an occluding member carriage positioned in each carriage passageway having an occluding member mounted thereon, the carriage being adapted for movement through the carriage passageway between a fully retraced position in which the occluding member is positioned generally out of the occlusion track and away from the reactive surface and the tubing in the occlusion track, and an extended position in which the occluding member is positioned so as to bear against and completely collapse the flexible tubing in the occlusion track against the reactive surface; and

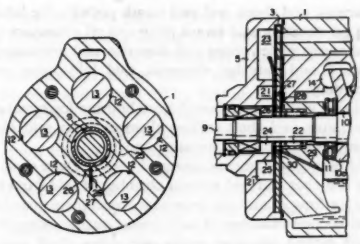
G. operating fluid distribution means for providing an operating fluid at a desired operating pressure from a remote operating fluid supply to each carriage passageway to control the occlusion force provided by each occluding member against the tubing received in the occlusion track and to control the position of each carriage between the fully retracted and fully extended positions.

5,009,574

THRUST BEARING AND SHOE LUBRICATOR FOR A SWASH PLATE TYPE COMPRESSOR

Hayato Ikeda; Masahiro Sawada, and Norihiko Nakamura, all of Kariya, Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Aichi, Japan

Filed Dec. 4, 1989, Ser. No. 445,289
Claims priority, application Japan, Dec. 2, 1988, 63-306369
Int. Cl.[5] F04B *1/16*
U.S. Cl. 417—222 **5 Claims**



1. A swash plate type refrigerant gas compressor incorporated in an air-conditioning circuit for a vehicle and having a pair of axially combined front and rear cylinder blocks having a plurality of cylinder bores formed therein, an axially extended bore for rotatably receiving a drive shaft via radial bearings seated in said axial bore, a swash plate chamber, and an oil chamber for storing a lubricating oil, said swash plate chamber and said oil chamber being interconnected with one another to permit the lubricating oil to enter said swash plate chamber;

a swash plate received in said swash plate chamber and keyed on said drive shaft and capable of rotating with said drive shaft and stirring the lubricating oil in said swash plate chamber;

a front housing arranged at one axial end of the combined cylinder blocks via a front valve plate, and having therein a central shaft sealing chamber through which said drive shaft extends, a front suction chamber for a refrigerant gas before compression, and a front discharge chamber for the refrigerant gas after compression, said shaft sealing chamber being fluidly interconnected with said swash plate chamber via gaps in said radial bearings in said axial bore of said combined cylinder block;

a rear housing arranged at the other axial end of the combined cylinder blocks via a rear valve plate, and having therein a rear suction chamber for the refrigerant gas before compression, and a discharge chamber for the refrigerant gas after compression, said rear suction chamber being fluidly interconnected to said front suction

chamber, and said rear discharge chamber being fluidly interconnected to said front discharge chamber,

a plurality of reciprocatory double-headed pistons slidably fitted in said cylinder bores and operatively engaged with said swash plate via shoes for carrying out a suction and compression of the refrigerant gas in said cylinder bores, and a discharge of the compressed refrigerant gas from said cylinder bores to said discharge chambers of said front and rear housings, said pistons sliding across said swash plate chamber to thereby cause a leakage of a part of the compressed refrigerant gas from said cylinder bores into said swash plate chamber while said drive shaft and swash plate are rotating, said leakage of a part of the compressed refrigerant gas generating a high pressure condition in said swash plate chamber;

a pair of thrust bearings mounted on said drive shaft for axially supporting said swash plate against a thrust force acting on said swash plate;

a suction refrigerant circuit for permitting the refrigerant gas before compression to flow toward said cylinder bores when said refrigerant gas before compression is returned from the air-conditioning circuit, said suction refrigerant gas circuit including at least said front and rear suction chambers, said cylinder bores, and a passageway interconnecting said front and rear suction chambers;

lubricating means for limiting an evacuation of the lubricating oil from said swash plate ad oil chambers to said suction refrigerant circuit during said high pressure condition in said swash plate chamber, to thereby promote a lubrication of movable elements including at least said thrust bearings, said shoes, and said swash plate by the lubricating oil stored in said swash plate and oil chambers when said swash plate rotates and disperses said lubricating oil toward said movable elements, said lubricating means including:

a partition wall formed in said front housing for structurally separating said shaft sealing chamber from said suction chamber of said front housing; and

a fluid passageway means arranged between said shaft sealing chamber and said suction chamber of said front housing for flow of said gas from said swash plate chamber to said suction chamber of said front housing through said shaft sealing chamber while said drive shaft and said swash plate were rotating, to thereby define a pressure in said shaft sealing chamber, intermediate between the pressure in the swash plate chamber and the pressure in the suction chamber, during the operation of the swash plate type compressor, said intermediate pressure in said shaft sealing chamber permitting separation of the lubricating oil from the gas when said lubricating oil is carried by said flow of the gas from the swash plate chamber to the suction chamber to thereby limit the loss of the lubricating oil from said swash plate chamber.

5,009,575

VAPOR LOCK PREVENTING MECHANISM IN MOTOR-DRIVEN FUEL PUMP

Kazumichi Hanai; Koichi Mine, and Hikaru Kikuta, all of Obu, Japan, assignors to Aisan Kogyo Kabushiki Kaisha, Obu, Japan

Filed Oct. 31, 1989, Ser. No. 428,886

Claims priority, application Japan, Nov. 7, 1988, 63-145311[U]

Int. Cl.[5] F04D *9/00*

U.S. Cl. 417—244 **8 Claims**

6. A two-stage fuel pump comprising:

(a) a first impeller;

(b) a first wall for surrounding said first impeller;

(b-1) a first pump chamber being defined between an inner surface of said first wall and an outer circumference of said first impeller;

(b-2) said first wall being formed with a fuel inlet communicating with said first pump chamber to suck fuel into said first pump chamber;

(b-3) said first wall being formed with a vapor jet communicating with said first pump chamber to discharge a vapor of said fuel from said first pump chamber;

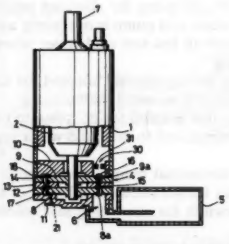
(c) a second impeller having a size and a shape identical with those of said first impeller; and

(d) a second wall for surrounding said second impeller;

(d-1) a second pump chamber being defined between an inner surface of said second wall and an outer circumference of said second impeller;

(d-2) said second pump chamber having a sectional shape substantially the same as that of said first pump chamber;

(d-3) said second wall being formed with a fuel outlet communicating with said second pump chamber to discharge said fuel;



(d-4) a part of said second wall partitioning said first pump chamber from said second pump chamber, said part being formed with a communication hole for communicating said first pump chamber with said second pump chamber;

(e) wherein a ratio of (a sectional area of said fuel outlet)/(a sectional area of said second pump chamber) is equal to or less than 1.4, and said vapor jet is formed at a position where a fuel pressure is boosted to a value greater than a half of a set pressure of a pressure regulator for regulating a pressure of said fuel to be discharged from said fuel outlet;

(f) whereby a boosting rate in said first pump chamber can be made larger than that in said second pump chamber to efficiently discharge said vapor.

5,009,576

COMPRESSOR UNLOADER CONTROLLER

Thomas R. Gagnet, Moneta, Va., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Jan. 8, 1990, Ser. No. 462,164

Int. Cl.[5] F04B *49/00*

U.S. Cl. 417—295 **7 Claims**

1. An apparatus comprising:

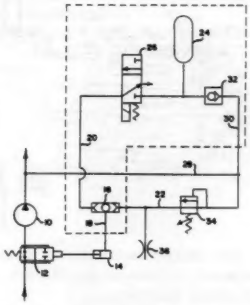
a compressor having an inlet and an outlet;

compressor inlet valve means, movable between a normally open and a closed position, for regulating fluid flow to the compressor inlet;

a pressure reservoir containing pressure sufficient to bias the compressor inlet valve means into the closed position;

means for separating the pressure in the reservoir from the pressure in the outlet of the compressor; and

starter valve means for applying pressure from the pressure reservoir to the inlet valve means, which is normally



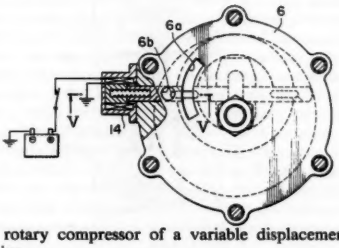
closed when the compressor is not operating and is opened during the starting of the compressor.

5,009,577

ROTARY COMPRESSOR OF VARIABLE DISPLACEMENT TYPE

Isao Hayase, Katsuta, and Kunisuke Tejima, Mito, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 20, 1989, Ser. No. 425,128
Claims priority, application Japan, Oct. 28, 1988, 63-272659
Int. Cl.[5] F04B *49/02, 21/02;* F01C *21/00*
U.S. Cl. 417—295 **6 Claims**



1. A rotary compressor of a variable displacement type comprising:

a cylinder having an inner peripheral surface and both axial ends;

a rotor means including a rotor accommodated in said cylinder in an eccentric relationship therewith and at least one vane incorporated in said rotor through an outer periphery of the latter, said vane being movable relative to said rotor reciprocatably in a longitudinal direction of said vane;

two side plates for closing said cylinder at both ends of the latter;

said vane dividing a working space defined by said rotor, said cylinder and said side plates into a plurality of spaces;

suction port means formed in at least one of said side plates and being opened at a surface of the side plate making sliding contact with said rotor;

opening means formed in a rear side portion of the vane as viewed in a direction of said rotor and being opened at a surface of the vane making sliding contact with the rotor, said opening means being adapted to be repeatedly communicated with and interrupted from said working space according to the reciprocative movement of the vane relative to the rotor; and

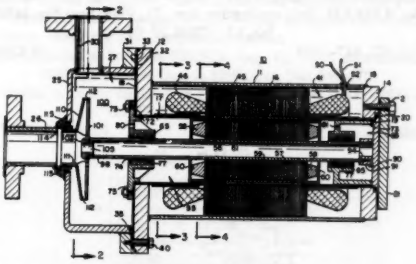
suction passage means formed in said rotor means for establishing a communication between said suction port means and said opening means in a predetermined range of rotation of said rotor means, wherein said suction passage means including a passage formed in said vane and having a depth smaller than a thickness of said vane, said passage having one end opened at a surface of said vane making sliding contact with the side plate and the other end communicated with said opening means.

5,009,578

MOTOR DRIVEN PUMPS

George J. Hyland, Norristown, Pa., assignor to Crane Co., New York, N.Y.

Filed Oct. 27, 1987, Ser. No. 114,403
Int. Cl.[5] F04B *35/04*
U.S. Cl. 417—365 **6 Claims**



1. A motor driven pump which includes

an impeller housing having inlet and delivery connections and having an impeller chamber witn an impeller therein,

an outer cylindrical casing connected to said impeller housing and closed off by first and second end plates, a cylindrical sleeve extending between said end plates and providing therewith and with said outer casing an isolated motor stator chamber, a motor stator in said stator chamber, the interior of said sleeve providing a motor rotor chamber, the improvement which comprises

first and second adaptors fixedly mounted within said sleeve at opposite ends thereof,

said first adaptor being mounted adjacent said impeller and said second adaptor being mounted at the end opposite thereto,

said first adaptor having at least one fixed orifice of selected size therealong connecting the interior of said sleeve with said impeller chamber permitting controlled fluid flow therebetween,

an end liner plate between said second adaptor and said second end plate,

said second adaptor having at least one fixed orifice therealong of larger diameter than said first orifice and connecting the interior of said sleeve with a chamber formed between said second adaptor and the end plate at the end of said sleeve opposite said impeller for controlled fluid flow therebetween,

a hollow shaft having sleeve bearings secured thereto, carried in said first and second adaptors, and extending into said impeller chamber, said impeller being mounted to said shaft in said impeller chamber,

a motor rotor on said shaft between said bearings in said motor rotor chamber,

said first and second adaptors have sleeves therein engaged with said bearings carried by said shaft,

automatic thrust balancing means for balancing the axial forces on said shaft which includes

an impeller flow limitor to limit fluid flow from said impeller chamber into said hollow shaft adjacent said end of said impeller, such that axial movement permits fluid flow therein to balance the shaft axial forces,

snubber means carried on said shaft in said chamber at the shaft end opposite to said impeller,

said snubber means having an end surface,

said end liner plate adjacent said snubber means having a surface facing said snubber means end surface, such that axial movement of said shaft permits fluid flow between said end liner plate and said snubber and through said orifice in said second adaptor into said second adaptor chamber in controlled modulated amounts and therefrom into said shaft upon axial movement of said shaft for thrust balancing.

5,009,579

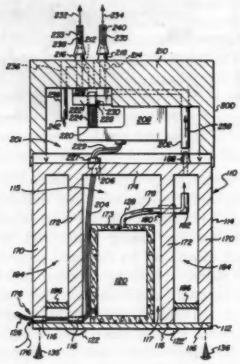
FLUID PUMP ENCASEMENT

Benton H. Grant, Stamford, Conn., assignor to Grant Airmass Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 230,462, Aug. 15, 1988, Pat. No. 4,834,625. This application Apr. 27, 1989, Ser. No. 345,030

Int. Cl.[5] F04B *21/00*

U.S. Cl. 417—413 **25 Claims**



1. A fluid pump encasement having improved acoustic characteristics comprising:

a base;

a pump housing of a substantially ceramic material forming a chamber open to one side;

a lip depending from the periphery of the open side for mating with the base; and

means for clamping the base to the lip to provide relatively quick assembly and disassembly enabling replacement of the hollow sphere for decorative reasons.

5,009,580

MULTIPLE RECIPROCATING PUMP

Shingo Maru, Chiba, Japan, assignor to Maruyama Mfg. Co., Ltd., Tokyo, Japan

Filed Aug. 24, 1990, Ser. No. 572,224

Claims priority, application Japan, Dec. 28, 1989, 1-338358

Int. Cl.[5] F04B *23/06*

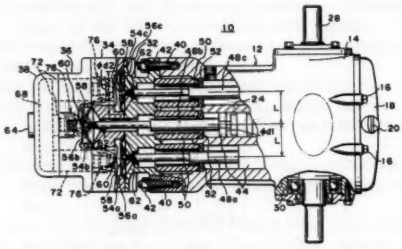
U.S. Cl. 417—533 **8 Claims**

1. A multiple reciprocating pump, comprising:

a drive shaft;

a plurality of reciprocating members having parallel axes and a length in the direction of the axes, being disposed to one side of the drive shaft, and being operably connected to the drive shaft to reciprocate along said axes, wherein the length of each reciprocating member is different from the length of a nearest adjacent member; and

a pump chamber corresponding to each reciprocating member, each chamber having a volume and wall member operably connected to reciprocate with the corresponding reciprocating member, wherein the volume of the pump chamber increases and decreases as the wall member reciprocates to take in and discharge fluid from the pump



chamber, and wherein each chamber is displaced from a nearest adjacent chamber in the direction of the axes of the reciprocating members.

5,009,581

FLUID ACCUMULATOR FOR ANTI-SKID BRAKES

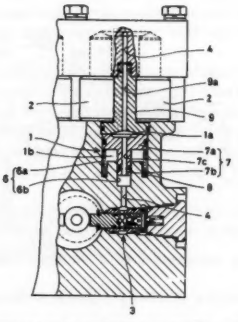
Takashi Kushiyama, and Yoshiyasu Kurihara, both of Higashimatsuyama, Japan, assignors to Jidosha Kiki Co., Ltd., Tokyo, Japan

Filed Dec. 20, 1989, Ser. No. 453,513

Claims priority, application Japan, Dec. 27, 1988, 63-330225

Int. Cl.[5] F04B *11/00*

U.S. Cl. 417—540 **4 Claims**



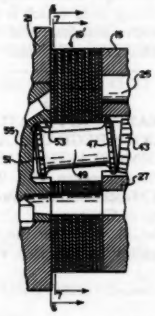
1. A fluid control unit including a body means having an operating fluid passage formed therein of a predetermined diameter, said fluid passage including a first passage portion of greater diameter than said predetermined diameter and a second passage portion of greater diameter than said first passage portion, piston means including a first piston portion having a diameter and being slidably and liquid-tightly disposed within said first passage portion, said piston means including a second piston portion having a diameter greater than the diameter of said first piston portion and being slidable and liquid-tightly disposed in said second passage portion, said second piston portion defining with said body means an air chamber in communication with atmospheric air, biasing means urging said piston means in a first direction away from said first said passage portion, said second piston portion having an outer face remote from said first piston portion, said outer face defining a movable side of a fluid accommodating chamber for receiving fluid when said piston means moves in a second direction opposite to said first direction, said piston means having an axial passage passing completely therethrough and being in communication with said operating fluid passage.

5,009,582

ROTARY FLUID PRESSURE DEVICE AND IMPROVED STATIONARY VALVE PLATE THEREFOR

Marvin L. Bernstrom, Eden Prairie, Minn., assignor to Eaton Corporation, Cleveland, Ohio

Filed Aug. 9, 1989, Ser. No. 391,803
Int. Cl.[5] F01C 1/10, 19/08
U.S. Cl. 418—61.3 10 Claims



1. A rotary fluid pressure device of the type including housing means defining a fluid inlet port and a fluid outlet port; a rotary fluid displacement mechanism including a ring member having a plurality N+1 of internal teeth, and a star member having a plurality N of external teeth, said star member being eccentrically disposed within said ring member, the teeth of said ring member and said star member interengaging to define expanding and contracting fluid volume chambers during relative movement therebetween, one of said ring member and said star member having rotational movement about its own axis, and one of said members having orbital movement about the axis of the other of said members; a stationary valve member operatively associated with said housing means and defining a stationary valve surface oriented generally transversely relative to said axes of rotation, said stationary valve member further defining a plurality N+1 of first fluid passages, each of said first fluid passages being in fluid communication with one of said fluid volume chambers, and having passage openings in said stationary valve surface, arranged circumferentially relative to said axis of one of said ring member and said star member; a rotary valve member, movable in synchronism with said rotational movement of said one of said ring member and said star member, said rotary valve member including a valve surface disposed in sliding, sealing engagement with said stationary valve surface, and defining a plurality 2N of valve ports having openings in said valve surface arranged circumferentially relative to the axis of said rotary valve member, said plurality 2N of valve ports including a first group of valve ports having constant fluid communication with said fluid inlet port, and a second group of valve ports having constant fluid communication with said fluid outlet port; at least a portion of said plurality 2N of valve port openings being in fluid communication with at least a portion of said first fluid passage openings during said relative orbital and rotational movement to direct fluid from said inlet port to said expanding volume chambers, characterized by:

(a) said stationary valve member further defining a plurality N+1 of second fluid passages, each of said second fluid passages having passage openings in said stationary valve surface, said second fluid passage openings being arranged circumferentially relative to said axis of said one of said ring members and said star member, each of said second fluid passages being approximately diametrically disposed from one of said first fluid passages;

(b) said stationary valve member further defining a plurality N+1 of third fluid passages, each of said third fluid passages providing fluid communication between only one of said first fluid passages and only said one of said second fluid passages diametrically disposed therefrom; and

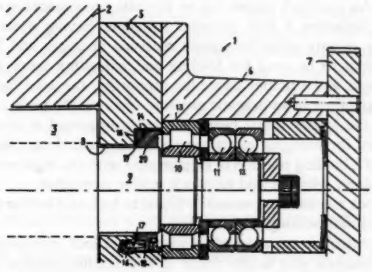
(c) said fluid pressure device including means for blocking direct fluid communication from said second fluid passages to said fluid volume chambers.

5,009,583

SHAFT SEAL AND BEARING MEMBERS FOR A ROTARY SCREW COMPRESSOR

Anders Carlsson, Ingarö ; Lars Johansson, Stavsnäs, and Frits Söderlund, Saltsjöbaden, all of Sweden, assignors to Svenska Rotor Maskiner AB, Stockholm, Sweden

Continuation of Ser. No. 399,513, Aug. 28, 1989, abandoned.
This application Oct. 9, 1990, Ser. No. 595,675
Claims priority, application Sweden, Mar. 19, 1987, 8701123
Int. Cl.[5] F04C 18/16, 27/00
U.S. Cl. 418—104 3 Claims



1. In a screw rotor machine for a working fluid, comprising:

a pair of intermeshing rotors (3) having helical lands and intervening grooves; and

a casing with a working space generally comprised of two intersecting bores, each enclosing one of the rotors (3), said casing having a low pressure end section (4), a high pressure end section (1) carrying bearings (10, 11, 12) for the rotors (3) and an intermediate barrel section (2), said intermediate barrel section (2) being connected to at least one of said end sections (1, 4) by means of a detachable joint, and said high pressure end section (1) being provided with a bearing chamber separated from the working space by an end wall (5) provided with a plurality of holes (8), each hole freely surrounding a cylindrical projection (9) of a rotor (3),

the improvement comprising:

a separate annular element (15) axially fixed with respect to said end section and surrounding each one of the respective rotor projections (9), the annular elements (15) each having a radial inner surface (20) which forms a sealing surface with a running clearance, said sealing surface cooperating with the respective rotor projection (9) by a very slight radial contact sealing force;

the end section having a recess within which said annular element is free to move to a certain distance in the radial direction; and

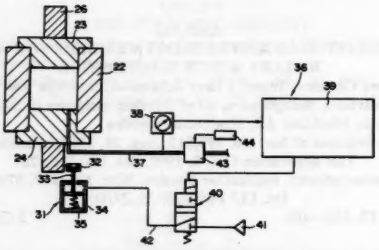
the annular elements (15) each being radially movable substantially without friction in the casing, always to maintain position alignment with the axis of the rotor projection, and being in axial sealing contact with the casing, the annular elements (15) each being non-rotatably fixed to the casing.

5,009,584

INTERLOCK SYSTEM FOR ISOSTATIC FORMING PRESS

Katsuhiro Uehara; Masanori Kurita, and Masakazu Murakami, all of Kobe, Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Mar. 2, 1990, Ser. No. 487,444
Claims priority, application Japan, Mar. 2, 1989, 1-51695
Int. Cl.[5] B29C *43/10*; B22F *3/04*
U.S. Cl. 425—135 4 Claims



1. An interlock system for an isostatic press machine of the type including a high pressure container having upper and lower closure plugs releasably received in upper and lower openings to be used for loading and unloading work therethrough, and a holder frame for supporting the axial force of the container in an isostatic pressing phase of the press operation, the holder frame being pivotally supported at one side thereof for swinging movements about a vertical axis into and out of a holding position in engagement with the high pressure container, wherein said interlock system comprises:

a lock mechanism constantly urged to lock said holder frame in said holding position; and

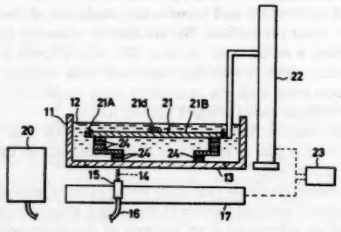
a control means adapted to control said lock mechanism to maintain said holder frame in said holding postion when the internal pressure of said high pressure container is higher than a predetermined level and to release the lock mechanism when the internal pressure of said high pressure container is lower than said predetermined level.

5,009,585

OPTICAL MOLDING APPARATUS AND MOVABLE BASE DEVICE THEREFOR

Yoshinao Hirano; Katsumo Sato; Shigeru Nagamori; Katsuhide Murata, all of Chiba; Kazuhito Horikiri, and Junji Shirai, both of Okayama, all of Japan, assignors to Mitsui Engineering & Shipbuilding Co., Ltd., Tokyo, Japan

Filed Dec. 18, 1989, Ser. No. 451,760
Int. Cl.[5] B29C *35/08*; B05D *3/06*
U.S. Cl. 425—174.4 3 Claims



1. An optical molding apparatus used for an optical molding method including the steps of radiating light onto a photocurable resin so as to cure the resin at an irradiated portion and laminating the cured portions to form an object, said apparatus comprising:

a container having an aperture in one of a bottom portion and a side portion thereof, and a light transmitting plate with an inner surface situated in said aperture;

a base which is movable away from the inner surface of said light transmitting plate, said base being composed of a square frame;

a light radiation apparatus for radiating light into said container through said light transmitting plate; and

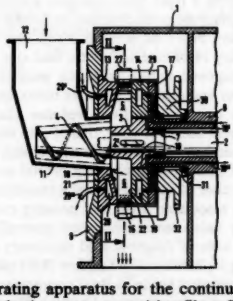
a cured object holding plate which is mounted to and dismounted from above said base, said cured object holding plate being inserted into said frame.

5,009,586

AGGLOMERATING APPARATUS FOR THE CONTINUOUS REGRANULATION OF THERMOPLASTIC WASTES

Wilhelm Pallmann, Zweibruecken, Fed. Rep. of Germany, assignor to Pallmann Maschinenfabrik GmbH & Co. KG, Zweibruecken, Fed. Rep. of Germany

Filed Dec. 12, 1989, Ser. No. 448,842
Claims priority, application Fed. Rep. of Germany, Dec. 14, 1988, 3842072
Int. Cl.[5] B29C *47/52*
U.S. Cl. 425—311 4 Claims



1. Agglomerating apparatus for the continuous, regranulation of thermoplastic wastes comprising films, fibers, filaments, cords, fabrics, carpet backings, foam materials, and mixtures of these materials, the apparatus comprising:

(a) stationary, axially spaced annular walls having radially inner and outer ends, and opposite inside surfaces

(b) an annular die interposed between and connected to said annular walls at the radially outer ends thereof, said die containing perforations over at least part of its annular surface, said annular walls and said die defining therewithin a plasticizing chamber,

(c) a feed inlet communicating with said plasticizing chamber,

(d) shaft means including a rotor hub mounted in said apparatus generally centrally with respect to said plasticizing chamber, and means for rotating said shaft and hub,

(e) at least one pressing blade nonrotatably mounted on said hub for rotation in said plasticizing chamber, said at least one blade having a leading flank and being constructed such that when combined with the inside surface of said die, said plasticizing chamber steadily narrows in a direction opposite to the direction of rotation of said at least one blade,

(f) knife means mounted for rotation outwardly of said annular die for contacting the radial outer surface of said die and cutting agglomerated material passing through said die perforations, and

wherein the spacing of said annular walls and the pressing blade at their radially outer portions is less than the spacing at their radially inner portions thereby to define a radially outward narrowing of said plasticizing chamber,

such narrowing permitting throughput capacity to be increased without thermal damage to the material.

5,009,587

INJECTION MOLDING MACHINE FOR MAKING TUBULAR WORKPIECES FROM PLASTIC MATERIAL

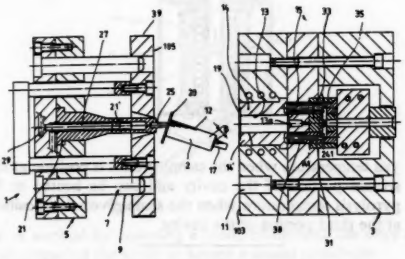
Romeo Corvaglia, Ramsen, and Martin Schöttli, Schaffhausen, both of Switzerland, assignors to Schottli AG, Diessenhofen, Switzerland

Continuation of Ser. No. 259,327, Oct. 18, 1988, abandoned. This application Dec. 28, 1989, Ser. No. 455,767

Claims priority, application Switzerland, Oct. 31, 1987, 4257/87

Int. Cl.[5] B29C *45/22*

U.S. Cl. 425—549 **18 Claims**



1. An injection molding machine comprising a first mold section and a second mold section, said first and second mold sections respectively having confronting first and second surfaces and at least one of said sections being movable between operative and retracted positions in which said surfaces respectively abut and are spaced apart from each other, said first section having at least one substantially cylindrical recess with an open end at the first surface and a second end remote from the first surface, and an end wall at said second end; at least one core having a circumference and provided on and extending from the surface of said second section and being received in said recess with play in the operative position of said one section so that said at least one core and said first surface then define an elongated mold cavity; and means for supplying plasticized material into said cavity, said means for supplying said plasticized material including at least two nozzles carried by said first section adjacent said end wall in line with said recess, each nozzle being substantially coaxial with said recess and having a plurality of orifices for admission of said plasticized material into said cavity at said end wall, said orifices being spaced apart from each other along the circumference of the at least one core in said recess each orifice having a discharge end adjacent the second end of said recess so that the supplied plasticized material flows from said end wall toward said first surface to expel air from the mold cavity at the first surface of said first mold section and to center the at least one core in said recess.

5,009,588

TIME-DELAY CIRCUIT FOR AUTOMATIC SHUTDOWN OF FURNACE SYSTEMS

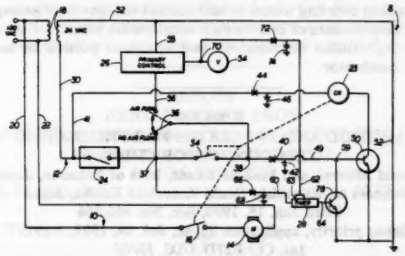
Roger W. Williams, Jr., Springfield, Mass., assignor to R. E. Phelon Company, Inc., East Longmeadow, Mass.

Filed Jun. 26, 1990, Ser. No. 544,192

Int. Cl.[5] F23N *5/00*

U.S. Cl. 431—31 **5 Claims**

1. In a time-delay circuit for automatic shutdown of furnace systems having a power source connected to an induced draft blower motor, a primary burner control adapted to energize a fuel valve of the furnace, a relay controller adapted to control the operation of the induced draft blower motor and the primary burner control, a thermostat connected to supply energy selectively to the primary burner control and to a first electronic switching means connected, when conductive, to energize said relay controller, a second electronic switching means is connected, when conductive to turn "off" the first electronic switching means, the improvement comprising a timer including connections for at least a first and a second input and one output, the first input of said timer being connected to receive energy from the thermostat, the second input being connected in circuit with the primary burner control and the fuel valve so



that when the primary control energizes said fuel valve, the timer is also energized, the output of said timer being connected to said second electronic switching means so that when said timer generates an output signal, the second electronic switching means will be turned "on", said second electronic switching means being adapted to divert energy from and turn "off" said first electronic switching means to de-energize the relay controller and thus cut "off" both the primary burner control and the induced draft blower.

5,009,589

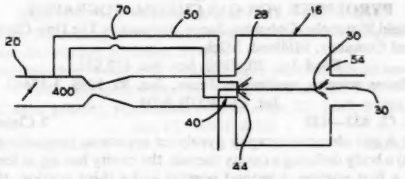
STORED ENERGY COMBUSTOR FUEL INJECTION SYSTEM

Jack R. Shekleton, San Diego, and Robert W. Smith, Lakeside, both of Calif., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Dec. 8, 1989, Ser. No. 447,599

Int. Cl.[5] F23M *9/00*

U.S. Cl. 431—183 **13 Claims**



1. A fuel injection system for a combustor having an upstream portion and a downstream portion comprising:

a fuel injector associated with said upstream portion of said combustor, said fuel injector having a fuel flow passage in communication with a source of fuel, said fuel flow passage terminating in said upstream portion of said combustor and including means for swirling fuel injected into said upstream portion of said combustor;

primary oxidant delivery means associated with said upstream portion of said combustor, said primary oxidant delivery means including a primary oxidant flow passage in communication with a source of oxidant for delivering a major portion of said oxidant in said combustor, said primary oxidant flow passage terminating in said upstream portion of said combustor;

secondary oxidant delivery means associated with said upstream portion of said combustor, said secondary oxidant delivery means including a secondary oxidant flow pas-

sage for delivering a minor portion of said oxidant to said combustor, said secondary oxidant flow passage terminating in said upstream portion of said combustor;

oxidant diverter means for diverting said minor portion of said oxidant from said primary oxidant flow passage to said secondary oxidant flow passage;

oxidant accelerating means for accelerating oxidant in said secondary oxidant flow passage to a higher velocity substantially independent of the velocity of oxidant in said primary oxidant flow passage and substantially independent of pressure in said combustor; and

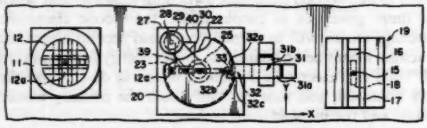
oxidant swirling means in said second oxidant flow passage downstream of said oxidant acceleration means for swirling oxidant delivered to said upstream portion of said combustor.

5,009,590

METHOD AND APPARATUS FOR PREHEATING SEMICONDUCTOR CHIPS

Tadashi Mitarai, and Makoto Kanda, both of Fukuoka, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Jan. 18, 1990, Ser. No. 466,866
Claims priority, application Japan, Jul. 24, 1989, 1-191977
Int. Cl.[5] F27D *3/00, 13/00*
U.S. Cl. 432—121 **8 Claims**



1. A method for preheating semiconductor chips comprising:

sequentially mounting a plurality of semiconductor chips on a rotatable table;

heating the semiconductor chips on the rotatable table, while the rotatable table is stationary, for a predetermined time; and

sequentially ejecting the heated semiconductor chips from the rotatable table.

5,009,591

PYROLYZER FOR GAS CHROMATOGRAPHY

Chuichi Watanabe, Gotemba, Japan, assignor to The Dow Chemical Company, Midland, Mich.

Filed Jan. 30, 1990, Ser. No. 472,532
Claims priority, application Japan, Jan. 30, 1989, 1-17443
Int. Cl.[5] F27B *9/02*
U.S. Cl. 432—128 **3 Claims**

1. A gas chromatography pyrolyzer apparatus comprising:

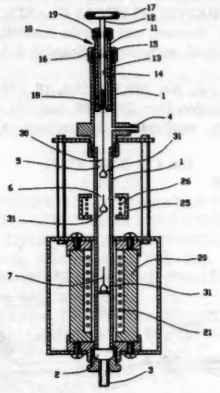
(a) a body defining a cavity therein, the cavity having at least a first portion, a second portion and a third portion, the body also defining a carrier gas inlet port therethrough in fluid communication with the cavity, the body further defining a carrier gas outlet port therethrough in fluid communication with the cavity so that a carrier gas can be flowed into the cavity through the carrier gas inlet port and then out of the cavity through the carrier gas outlet port to sweep any pyrolysis products generated in the cavity out of the carrier gas outlet port so that any pyrolysis products generated in the cavity can be analyzed by gas chromatography;

(b) a movable sample vessel positioned within the cavity for containing a sample to be pyrolyzed;

(c) a subsidiary heater for heating the second portion of the cavity;

(d) a subsidiary heater for heating the third portion of the cavity;

(e) means for selectively positioning the sample vessel at the first, second or third portions of the cavity so that a sample contained in the sample vessel is essentially not heated when the sample vessel is positioned at the first portion of the cavity, can be heated to a temperature below its pyrolysis temperature when the sample vessel is position at the second portion of the cavity and can be heated to its pyrolysis temperature when the sample vessel is position at the third portion of the cavity.

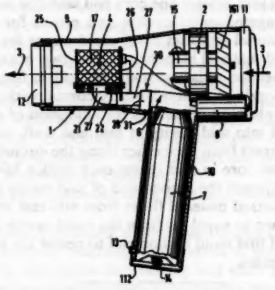


5,009,592

HOT AIR GENERATING DEVICE WITH A CATALYTIC BURNER

Antoine Roldan, Mions, and Daniel Demilliere-Vergnais, Francheville, both of France, assignors to Application Des Gaz, Paris, France

Filed Oct. 27, 1989, Ser. No. 427,496
Claims priority, application France, Oct. 28, 1988, 88 15370
Int. Cl.[5] F24H *1/00*
U.S. Cl. 432—222 **10 Claims**



1. A hot air-generating device, comprising:

a body which forms a conduit for the circulation of an air flow, extending from an inlet for fresh air to an outlet for hot air

a ventilation means arranged inside the body for generating the flow of air from the inlet towards the outlet of said conduit

a catalytic gas burner, which is disposed inside the conduit, which is connected with a source of pressurized fuel gas, and combustion fumes of which are mixed with the air flow to produce the hot air discharged through the conduit outlet, said burner being of the induced air type and comprising a means for mixing primary air in the fuel gas, an inlet outside said conduit to draw said primary air

independently and separately relative to the air flow circulating in said conduit, a chamber for distributing the fuel gas mixed with the air downstream of the mixing means, and a catalytic structure, the inlet face of which faces the distribution chamber, and the outlet face of which is in faces the conduit for the air flow.

5,009,593

METHOD AND APPARATUS FOR SECURING A DENTAL RESTORATION

Henry J. Vogelstein, New York, N.Y., assignor to Coltene/-Whaledent, Inc., New York, N.Y.

Filed Feb. 5, 1990, Ser. No. 475,649
Int. Cl.[5] A61C 5/08
U.S. Cl. 433—221 30 Claims

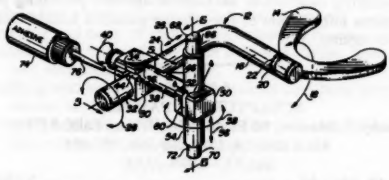
1. A method for restoring a tooth, comprising the steps of:
(a) preparing the tooth to accept a dental prosthesis;
(b) applying a polyacrylic acid solution to the prepared area;
(c) rinsing the prepared area until the area is clear from the polyacrylic acid solution;
(d) applying a drying agent to the prepared area; and
(e) securing a dental prosthesis to the prepared area through the use of a dental cement.

5,009,594

DISPOSABLE TRANSFER JIG ASSEMBLY

Weldon D. West, Mission Viejo, Calif., assignor to Denar Corporation, Anaheim, Calif.

Filed Jul. 18, 1989, Ser. No. 381,466
Int. Cl.[5] A61C 19/04
U.S. Cl. 433—73 8 Claims



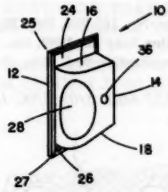
1. An adhesive fixatable disposable transfer jig apparatus for using in preparing a dental prosthetic, said apparatus comprising in combination:
(a) a bitefork having an arm extending therefrom;
(b) a first support rod;
(c) a first clamp block for interconnecting said arm with said first support rod and for fixating said arm with said first support rod, said first clamp block including a first cylindrical passageway for receiving said arm, a first slot extending from said first cylindrical passageway for accommodating a flow of adhesive intermediate said arm and said first cylindrical passageway, a second cylindrical passageway for receiving said first support rod, a second slot extending from said second cylindrical passageway for accommodating a flow of adhesive intermediate said first support rod and said second cylindrical passageway;
(d) a second support rod;
(e) a second clamp block for interconnecting said first support rod with said second support rod, said second clamp block being formed as an integral part of said second support rod and inseparable therefrom; said second clamp block including a third cylindrical passageway for receiving said second support rod, a third slot extending from said third cylindrical passageway for accommodating a flow of adhesive intermediate said third support rod and said third cylindrical passageway; and
(f) said first and second slots being interconnected with one another to accommodate flow of adhesive into each of said first and second passageways upon a single application of adhesive into one of said first and second slots.

5,009,595

DENTAL MOUTH PROP

Carl F. Osborn, 106 Stuyvesant Rd., Asheville, N.C. 28803

Filed Jul. 28, 1989, Ser. No. 386,157
Int. Cl.[5] A61C 5/00
U.S. Cl. 433—140 10 Claims



1. A mouth prop for dental patients comprising:
a block; said block being of a substantially unitary construction; said block being somewhat tapered in shape wherein said block has a long end and a short end; said block having a substantially straight and continuous top sloping surface and a substantially straight continuous bottom sloping surface for providing resting areas for certain teeth; a portion of said block near said long end being thinner than other portions of said block, thereby enhancing access to the patient's mouth.

5,009,596

DEVICE FOR FIXING A DENTAL PROTHESIS

Per O. Soderberg, Stockholm, Sweden, assignor to Astra Meditec Aktiebolag, Molndal, Sweden

Continuation of Ser. No. 183,849, Apr. 20, 1988, abandoned.
This application Jan. 22, 1990, Ser. No. 469,798
Claims priority, application Sweden, Apr. 22, 1987, 8701655
Int. Cl.[5] A61C 8/00
U.S. Cl. 433—173 2 Claims

1. A device for fixing a dental prosthesis, which device as parts thereof comprises a spacing element adapted for anchoring into the jaw-bone of a patient and a socket adapted for fixing into a dental prosthetic part, wherein the socket rests on the spacing element via an outer conical supporting surface

provided on one of said parts, which supporting surface bears against an inner conical supporting surface provided in the other of said parts, characterized in that a shoulder is provided on the part having the outer conical supporting surface, which shoulder has a planer surface oriented radially around the periphery of the supporting surface, and that an end surface is provided on the part having the inner conical supporting surface, the end surface being oriented radially around the periphery of said supporting surface, and wherein the planar surface and the end surface have such an axial position on the respective part that an externally visible fine gap of uniform and predetermined thickness is formed between them on bearing of the supporting surfaces properly against each other, whereby an improperly formed gap provides a visible indication that the parts do not properly bear against one another.

5,009,597

COMPOSITE DENTAL PROSTHESIS ELEMENT FORMED OF FILLED ACRYLATE/METHACRYLATE POLYMERS

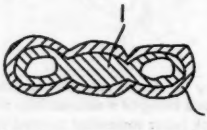
Roland Schaefer, Friedrichsdorf, Fed. Rep. of Germany, assignor to Kulzer & Co. GmbH, Wehrheim, Fed. Rep. of Germany

Continuation of Ser. No. 162,098, Feb. 29, 1988, abandoned. This application May 25, 1989, Ser. No. 358,456

Claims priority, application Fed. Rep. of Germany, Mar. 17, 1987, 3708618

Int. Cl.[5] A61C *5/09, 8/00, 13/00*

U.S. Cl. 433—212.1 **25 Claims**



1. A plastic dental prosthesis element for crowns, bridges and inlays comprising a core formed of a plastic material comprising an 70-10% by weight of an acrylate or methacrylate or mixture thereof based polymer containing 30–90% by weight of an inorganic filler, said inorganic filler being comprised of 60–100% of an inorganic dental filler material selected from the group consisting of silicon dioxide, lithium aluminum silicate glass, strontium aluminum silicate glass and a mixture thereof, and having a particle size of from 0.7–5 micrometers, and 0–40% by weight of microdispersed silicon dioxide having a particle size from 0.01 to 0.04 micrometers, and

a jacket disposed over said core and being formed of a plastic material comprising 90-10% by weight of an acrylate, methacrylate or mixture thereof based polymer containing 10-90% by weight of microdispersed silicon dioxide having a particle size of 0.01 to 0.4 micrometers as the sole filler,

said core having a mechanical strength greater than the mechanical strength of the jacket, whereby thin-walled shapes and slender embodiment of the prosthesis element are enabled, said core having a flexural strength of 160 to 183 MPa and having a bending modulus of 17,800 to 19,000 MPa and said jacket having a flexural strength of 65 to 90 MPa having a bending modulus of 3500 to 3900 MPa.

5,009,598

FLIGHT SIMULATOR APPARATUS USING AN INOPERATIVE AIRCRAFT

Thomas E. Bennington, Box 2392, Palm Beach, Fla. 33480

Filed Nov. 23, 1988, Ser. No. 274,838

Int. Cl.[5] G09B *9/08*

U.S. Cl. 434—30 **13 Claims**

1. A flight simulator apparatus removably installable in and using an actual aircraft not in flight and having movable control members comprising;

an actual aircraft and aircraft instrument panel, said aircraft being currently non-operative and grounded,

an aircraft instrument panel overlay containing a plurality of simulated instruments, said simulated instruments capable of mimicking and duplicating the movements and responses of actual aircraft instruments,

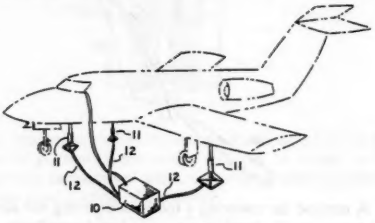
a central computer,

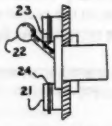
said simulated instruments of said aircraft instrument panel overlay mountable over the existing actual individual instruments of said actual aircraft instrument panel and receiving output from said central computer,

said central computer adapted to provided simulated displays of the operating instruments of an actual operating aircraft by means of said instrument panel overlay,

a plurality of position sensing means mounted to and adjacent said control members of said actual aircraft and electrically connected to said computer, said position sensing means moving with said control members,

said position sensing means for providing output to said central computer relating to the position of said actual control members,





an indicator light overlay comprising individual indicator lights positioned over actual indicator lights of said aircraft and electrically connected to said computer,

said indicator light overlay receiving signals from said central computer to simulate the appropriate activation of indicator lights in an actual operating aircraft, and

an aircraft switch overlay mounted adjacent existing switches in said actual aircraft and including secondary switches, which open or close upon movement of said existing switches in said actual aircraft, providing positions information of the existing switches to said central computer.

5,009,599

SCULPTURE APPARATUS

Timothy T. Mueller, 96 Eagle Point, Irvine, Calif. 92714

Filed Dec. 18, 1989, Ser. No. 451,601

Int. Cl.[5] G09B *11/00*

U.S. Cl. 434—81 **7 Claims**

1. An educational sculpture apparatus comprising, in combination,

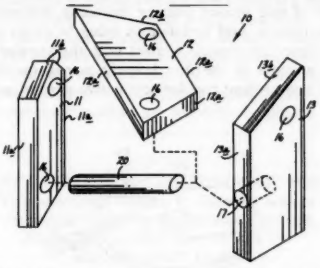
a plurality of plate members, each plate member including a planar top surface overlying and coextensive with a planar bottom surface, and further including at least two parallel sides and two non-parallel sides,

a plurality of rods including end portions, and each plate member including a plurality of bores for receiving the rod end portions for forming an erected educational sculpture, and

wherein each of the plate members is of a varying geometric configuration relative to other plate members, and each plate member is of an equal predetermined thickness, and

the plate members include a predetermined plurality of plate members, including bores in a parallel and non-parallel relationship relative to each other, wherein the plurality

of bores includes bores oriented orthogonally relative to the top and bottom surfaces, and the plurality of bores include blind bores positioned in a non-through-extending



relationship relative to the plate member, and the plurality of bores include angular bores oriented at a non-orthogonal inclination relative to the top and bottom planar surfaces of an associated plate member.

5,009,600

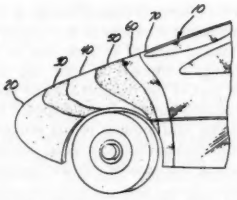
METHOD OF PAINTING CLAY BODIES

Robert L. DeLaRosa, Livonia, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 28, 1990, Ser. No. 486,624

Int. Cl.[5] G09B *11/00*; B05D *1/36*

U.S. Cl. 434—82 **4 Claims**



1. A method of painting a clay body and maintaining a durable decorative surface finish by providing a barrier film layer between the paint coat layer and the clay body such that the oily substance contained in the clay body being blocked from permeating through said barrier film to adversely affect said paint coat layer comprising the steps of:

providing a body of clay ready to be decorated,

coating said body of clay with a strippable coating layer,

coating said body of clay with a diluted shellac layer over said strippable coating layer,

coating said body of clay with a primer coat layer over said shellac layer, and

coating said body of clay with a color coat layer of a desirable color over said primer coat layer.

5,009,601

METHOD FOR TEACHING GARMENT BUTTONING

Richard W. Mechling, 830 Vedado Way NE., Atlanta, Ga. 30308

Filed Aug. 19, 1988, Ser. No. 234,198

Int. Cl.[5] G09B *19/00*

U.S. Cl. 434—260 **2 Claims**

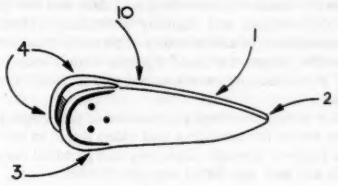
1. A method of teaching the skill of garment buttoning to a subject, comprising the steps of:

(a) providing a button with an elongated and pointed side to allow increased sensation to the thumb and index finger of the subject;

(b) providing said button with raised and flaired edges on a side opposite said elongated and pointed side to allow increased sensation to the thumb and index finger of the subject;

(c) selecting an initial predetermined length of said elongated and pointed side of said button according to the subject's level of buttoning skill;

(d) allowing the subject to attempt to perform the buttoning task using said button which has said initial predetermined length to said elongated and pointed side;



(e) decreasing the length of said initial predetermined length to said elongated and pointed side for a subject demonstrating improved or progressive buttoning skills.

5,009,602

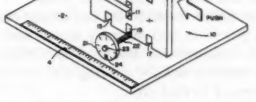
ROTATIONAL MOVEMENT TRAINING APPARATUS

Clifton B. Chandler, 227 Brookwood Way, Mansfield, Ohio 44906

Filed Mar. 28, 1990, Ser. No. 500,582

Int. Cl.[5] G09B *23/02, 23/04*

U.S. Cl. 434—300 **11 Claims**



1. An improved rotational movement training device comprises:

(a) mounting board means comprising at least one mounting board, said mounting board comprising:

(i) a top portion having a plurality of slots therein;

(ii) middle portion having a plurality of slots therein; and

(iii) a bottom portion having a plurality of slots therein; and

(b) a plurality of rotational means engageable in at least two of said slots for demonstrating a rotational movement;

(c) whereby movement of said mounting board means results in movement of said rotational means thereby facilitating derivation of a scientific and mathematical concept.

5,009,603

ELECTRONIC EDUCATIONAL VIDEO SYSTEM APPARATUS

Chi-Ming Fong, New Territories; Wai-Kwok Chew, Tai Po, N.T., and Garry C. Law, Kowloon, all of Hong Kong, assignors to Video Technology Industries, Inc., Wheeling, Ill.

Filed Aug. 19, 1988, Ser. No. 234,257

Claims priority, application United Kingdom, Oct. 28, 1987, 8725204

Int. Cl.[5] G09B *7/04, 15/00*

U.S. Cl. 434—323 **14 Claims**

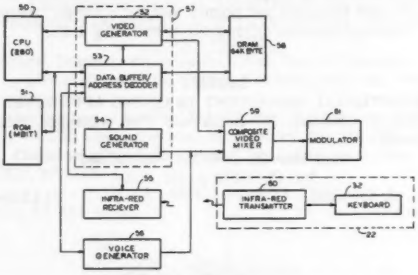
1. An electronic educational video system apparatus for connection to a standard television receiver for teaching basic skills to a child through the use of animated pictorial displays which serve to motivate said child to utilize said apparatus and enhance said child's learning, said electronic educational video system apparatus comprising:

memory means for storing digital data corresponding to a

plurality of pictorial representations, digital data corresponding to requests associated with said pictorial representations directing said child to provide a proposed correct response, said requests being both aural and textual, and digital data corresponding to the correct response to said requests associated with said pictorial representations;

display generation means electrically connected to said memory means for combining said data into said plurality of combinations and digitally generating video signals representative of said plurality of pictorial representations towards the generation of a single display incorporating said pictorial representations and said textural representations;

interface means electrically connected to said display generation means for providing said video signal to said television receiver towards displaying said pictorial representations and said associated requests thereon;



processor means electrically connected to said memory means and said display generation means;

said processor means for selecting one of said pictorial representations stored in said memory means and causing said selected pictorial representation to be displayed upon said television receiver and for causing said associated request to be presented to said child;

a plurality of interchangeable input means for permitting said child to provide a proposed correct response to said request;

means for comparing said child's proposed correct response with said correct response stored in said memory means;

means for animating said displayed pictorial representation associated with said request for proposed correct responses presented to said child so as to provide said child with an indication of the correctness of said child's proposed correct response.

5,009,604

ELECTRICAL CONNECTOR ASSEMBLY FOR VEHICULAR STEERING WHEEL

Edward J. Plocek, Lisle; Stephen Z. Weiss, Highland Park, and Maciej Pike-Biegunski, Warrenville, all of Ill., assignors to Molex Incorporated, Lisle, Ill.

Continuation-in-part of Ser. No. 252,308, Oct. 3, 1988, Pat. No. 4,904,190. This application Dec. 4, 1989, Ser. No. 445,514

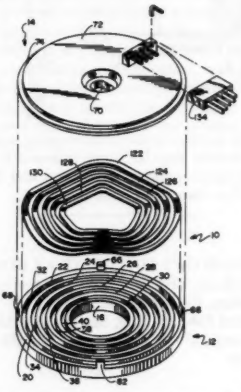
Int. Cl.[5] H01R *39/02, 39/06*

U.S. Cl. 439—15 **15 Claims**

1. An electrical connector assembly for achieving electrical connection between first and second members at least one of which is rotatable relative to the other, said assembly comprising:

a first housing mountable to said first member and comprising a nonconductive portion having a mating face and at least one annular conductive portion fixedly disposed on said mating face;

a second housing mountable to said second member and comprising a nonconductive portion having a mating face disposed in generally opposed relationship to the mating face of said first housing, said second housing having at least one resilient annular conductive portion nonrotatably disposed on the mating face thereof generally in register with the annular conductive portion on the mating face of said first housing, the resilient annular conductive portions of said second housing including resilient undulations therein, said undulations being in direct electrical and direct mechanical contact with the annular conductive portions of the first housing in register therewith, each said resilient annular conductive portion including a



contact tab for electrical connection to an electrical connector nonrotatably mounted to the second housing; and

wherein the mating face of at least one of said first and second housings comprises at least one annular recess, with at least part of the resilient annular conductive portion of said second housing being disposed in said annular recess, whereby said annular recess retains the resilient annular conductive portion at a radial position for electrically contacting the annular conductive portions in the first housing.

5,009,605

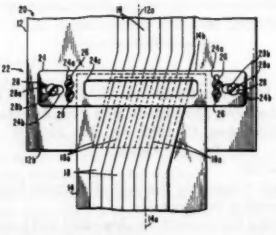
FLAT ELECTRICAL CONNECTOR ASSEMBLY WITH PRECISELY ALIGNED SOLDERING TRACES

William R. Crumly, Anaheim; Blake F. Woith, La Verne, and James R. Walen, Mission Viejo, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Mar. 13, 1990, Ser. No. 493,050

Int. Cl.[5] H01R *9/09*

U.S. Cl. 439—67 **10 Claims**



1. An electrical connector assembly, comprising:

a first member having a first longitudinal axis;

a plurality of electrically conductive first traces carried by the first member, including first generally parallel connector portions which are oriented at a predetermined acute angle to the first longitudinal axis;

a second member having a second longitudinal axis;

a plurality of electrically conductive second traces carried by the second member, including second generally parallel connector portions which are oriented at a like predetermined angle to the second longitudinal axis:

the first and second members being mateable such that the first and second longitudinal axes are substantially aligned, and relatively movable parallel to the first and second longitudinal axes to a position in which the first and second connector portions are respectively aligned.

5,009,606

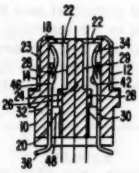
SEPARABLE ELECTRICAL CONNECTOR

Marc G. Villeneuve, and William P. Buckley, both of Toronto, Canada, assignors to Burndy Corporation, Norwalk, Conn.

Filed Dec. 18, 1989, Ser. No. 451,796

Int. Cl.[5] H01R *13/00*

U.S. Cl. 439—59 **19 Claims**



1. An electrical connector for electrical mating with a plug member having a plurality of male contact members and for electrical mounting on a printed circuit board, said electrical connector comprising a receptacle body, said body being defined by front and rear walls, a pair of end walls, a bottom wall and a top wall, a plurality of spaced passageways formed in said body and extending through said body from said top wall to said bottom wall, a single contact member received within each of said passageways, each of said contact members having a contact surface provided within its respective passageway, a depending gas tight contact portion provided on each of said contact members, said gas tight contact portions extending through said bottom wall of each passageway of said receptacle body and depending therefrom, said receptacle being adapted for electrical mating with said plug member by insertion of each of said male contact members into a respective one of said passageways, such that said contact surface electrically contacts said male contact member, said receptacle being adapted to be separably mounted on a printed circuit board by said contact portions contacting a conductive strip on said printed circuit board.

5,009,607

FLEXIBLE CIRCUIT CONNECTOR

Herman B. Gordon, Phoenix, Ariz.; Mark J. Owens, Vernon, Conn.; Leon Rubinstein, Natick, Mass., and Scott Simpson, Woodstock, Conn., assignors to Rogers Corporation, Rogers, Conn.

Filed Jul. 24, 1989, Ser. No. 384,269

Int. Cl.[5] H05K *1/00*

U.S. Cl. 439—67 **37 Claims**

1. An electrical connector for connecting a flexible circuit to another circuit device comprising:

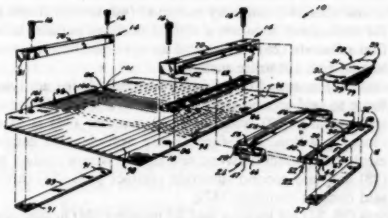
(1) male plug means, said male plug means including;

(a) block means having opposed upper and lower surfaces, said block means also having alignment means for aligning a flexible circuit which has been wrapped about said upper and lower surfaces of said block means;

(b) cover means attachable to said block means wherein a flexible circuit which has been wrapped about said block means will be sandwiched between said upper surface of said block means and said cover means, said cover means covering at least a portion of said upper surface of said block means with said lower surface of said block means being free of any coverage by said cover means; and

(c) pressure applicator means associated with said lower surface of said block means wherein said pressure applicator means will be sandwiched between said block means and a flexible circuit which has been wrapped about said block means;

(2) female adapter means attachable to another electronic device, said female adapter means including a hood having a hood opening therethrough, said hood opening having a predetermined size to receive at least a portion of said male plug means therein; and



(3) detachable engagement means for effecting detachable engagement between said male plug means and said hood opening in said female adapter means;

and further including;

at least a pair of spaced tabs extending outwardly from a front edge of said block means;

at least a pair of spaced apertures through said cover means and in registration with said tabs, said apertures receiving said tabs when said cover means is attached to said block means; and

snap-lock engagement means for snap-locking said cover means to said block means when said tabs are received in said apertures.

5,009,608

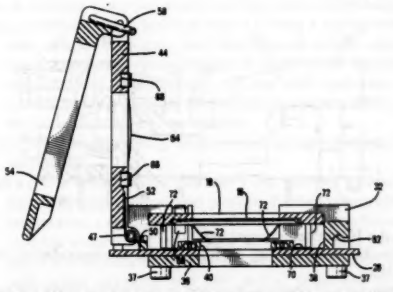
SEPARABLE CONNECTOR ASSEMBLY FOR AN IC CHIP CARRIER

Joanne E. Shipe, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Jul. 12, 1990, Ser. No. 553,217

Int. Cl.[5] H01R *13/62, 9/09;* **H05K** *1/00*

U.S. Cl. 439—331 **13 Claims**



1. A connector assembly for providing separable electrical connections between contact pads (28) on a surface of a first substrate (26) and respective contact pads (14) on a surface of a second substrate (12), comprising:

a frame (32) mounted on said surface of said first substrate (26), said frame (32) including a central opening (38) exposing said first substrate contact pads (28);

a connector housing assembly (40) supported on said first substrate (26) surface in said frame central opening (38), said connector housing assembly (40) including a plurality of contact members (42), each of said plurality of contact members having a first contact portion in contact with a respective one of said first substrate contact pads (28) and a second contact portion exposed through a planar surface of said connector housing assembly (40), said connector housing assembly (40) planar surface being parallel to said first substrate (26) surface and being spaced therefrom;

means (16, 18) for supporting said second substrate in said frame central opening above said connector housing assembly with said second substrate pads (14) in contact with respective ones of said exposed second contact portions of said plurality of contact members;

a lid member (44) hingedly mounted (46) to said frame (32) for movement between a closed position parallel to said first substrate (26) surface and an open position transverse to said first substrate surface;

means (64) mounted on said lid member (44) for applying a force to said second substrate (12) within said frame central opening (38) when said lid member (44) is in said closed position, said force being sufficient to establish electrical contact between said first substrate contact pads (28) and said second substrate contact pads (14) through said contact members (42);

means (58, 62) for locking said lid member (44) in said closed position; and

a handle member (54) hingedly mounted to said lid member (44), the hinged mounting (56) of the handle member (54) to the lid member (44) being parallel to and on the opposite end of the lid member (44) from the hinged mounting (46) of the lid member (44) to the frame (32);

said locking means including a hook member (62) on said frame at the end opposite where the lid member (44) is hingedly mounted and a latch member (58) hingedly mounted on said handle member (54) in the general vicinity of the hinged mounting (56) to the lid member (44), the latch member (58) cooperating with the hook member (62) to retain the lid member (44) in said closed position when the handle member (54) is moved to a position parallel relative the lid member (44).

5,009,609

CONTACT SHUTTER DEVICE IN IC SOCKET

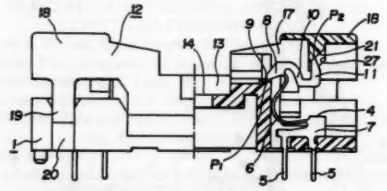
Noriyuki Matsuoka, and Junji Ishida, both of Tokyo, Japan, assignors to Yamaichi Electric Mfg. Co., Ltd., Tokyo, Japan

Filed Sep. 27, 1989, Ser. No. 413,389

Claims priority, application Japan, Sep. 30, 1988, 63-248614

Int. Cl.[5] H01R *13/62*

U.S. Cl. 439—73 **5 Claims**



1. An IC socket, comprising:

a socket body having an IC package accommodating portion;

a plurality of contacts disposed in said socket body for contacting terminal members of an IC package; and

a contact shutter member vertically movably mounted on said socket body for pushing said contacts such that said contacts move upward and backward from the terminal members of an IC package upon movement of said contact shutter member toward said socket body;

wherein each said contact comprises a fixing portion for fixing the contact in said socket body, a contact portion for contacting a terminal member, and means for causing said contact portion of said contact to move upward and backward from a first terminal member contact position to a second terminal member non-contact position in response to vertical movement of said contact shutter member toward said socket body, said means comprising a curved spring extending forward toward said IC package accommodating portion from said fixing portion to said contact portion, said curved spring having a double curve with a first concave portion adjacent said fixing portion facing away from said contact portion and a second concave portion adjacent and facing toward said contact portion, and a cantilever arm extending backward from said contact portion, said cantilever arm having a free end, said free end comprising a pressing force receiving portion for being pressed by said contact shutter member; and

wherein each said contact portion of said contacts has a forward end projecting forward in the direction of said IC package accommodating portion and said curved spring has a forwardmost portion at said first concave portion extending forward in the direction of said IC package accommodating portion, said forward end of said contact portion extending further forward than said forwardmost portion of said curved spring in said first terminal member contact position.

5,009,610

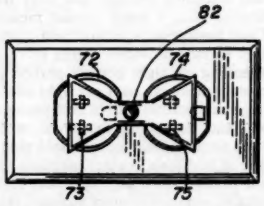
LIGHT SWITCH AND OUTLET GUARD

Robert Woskow, 16801 Severo Pl., Encino, Calif. 91436

Continuation-in-part of Ser. No. 204,217, Jun. 8, 1988, Pat. No. 4,876,425. This application Oct. 16, 1989, Ser. No. 422,147

Int. Cl.[5] H01R *13/44*

U.S. Cl. 439—142 **12 Claims**



1. In a wall plug outlet comprising a mounting plate having at least one mounting hole, at least one female plug outlet, and a mounting screw for said mounting hole, the improvement comprising:

a protective guard for said at least one female plug outlet, said guard comprising a main elongated portion comprising a first female plug-outlet cover portion for selectively closing off access to said at least one female plug outlet, and a second mounting portion connected to said first portion, said second portion having a through-opening formed therein for receiving therethrough said mounting screw, said guard being pivotally mounted to said wall plate via said mounting screw for a selected degree of difficulty of rotation thereof accomplished via the degree of tightening of said mounting screw in said mounting hole of said wall plate, whereby said guard may alternatively close off access to said female plug outlet and allow access thereto;

said second portion comprising a rearwardly projecting bead defining a hollow interior in direct alignment with said through-opening, said bead projecting from the rear surface face of said second portion, whereby said bead may project into said mounting hole of said wall plate, said mounting screw passing through said through-opening and said bead, said bead adding structural integrity to

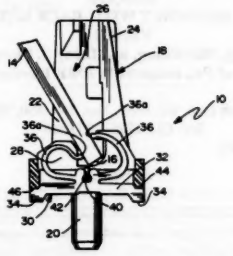
said main elongated portion and providing a seat during the rotation thereof; said bead comprising an outer frusto-conical circumferential surface, said outer surface capable of mating with the interior circumferential surface of said mounting hole of said mounting plate.

5,009,611

HIGH DENSITY ELECTRICAL CONNECTOR FOR PRINTED CIRCUIT BOARDS

Kent Regnier, Lombard, Ill., assignor to Molex Incorporated, Lisle, Ill.

Filed May 23, 1990, Ser. No. 527,464
Int. Cl.[5] H01R *13/00*
U.S. Cl. 439—326 **13 Claims**



1. A connector assembly for electrically connecting closely-spaced circuit elements disposed on two printed circuit boards one of which has a mating edge and a surface with a linear array of contact pads adjacent said edge, comprising:

an elongate dielectric housing having a cavity along its length for receiving the mating edge of said one printed circuit board;

means for mounting the housing to the other of the printed circuit boards;

a plurality of thin contact members mounted on the housing to form a closely-spaced linear terminal array, each contact member being adapted to engage a contact pad when the one printed circuit board is inserted into the cavity, and each contact member having a mounting socket; and

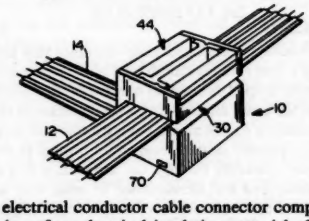
said housing having a mounting post positionable in the mounting socket of each contact member to seat the contact members on the housing.

5,009,612

MULTI-CONDUCTOR ELECTRICAL CABLE CONNECTOR

Paul L. Rishworth, Richmond; Denis L. Rishworth, Knysna Heights, both of South Africa, and Daniel A. Dixon, Naperville, Ill., assignors to Molex Incorporated, Lisle, Ill.

Filed Feb. 7, 1990, Ser. No. 479,302
Int. Cl.[5] H01R *4/24*
U.S. Cl. 439—403 **8 Claims**



1. An electrical conductor cable connector comprising:

a housing of an electrical insulating material, the housing having side walls and a lower portion defining an first open ended compartment,

a plurality of conductor engaging elements mounted in the lower portion and extending into the first compartment, each element having a portion located in the lower portion of the housing for electrically connecting an electrical conductor located in the lower portion of the housing to the conductor engaging element, the connector housing having a slot which extends from one side of the housing through the walls of the first compartment above the conductor engaging elements, the slot adapted to receive a first ribbon tape cable having a plurality of insulation covered electrical conductors,

a first press member of an electrical insulating material slidably mounted in the first compartment for pressing the first cable against the conductor engaging elements located in the first compartment,

means for locking the first press member in a first position in the first compartment such that the first member is located above the slot, the first cable adapted to be introduced into the slot and terminated to the conductor engaging elements without removal of the first press member,

means for clamping the first cable to the housing, and

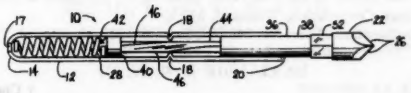
means for locking the first press member in a second position in the first compartment to maintain the first cable clamped to the housing.

5,009,613

SPRING CONTACT TWISTER PROBE FOR TESTING ELECTRICAL PRINTED CIRCUIT BOARDS

Ulf R. Langgard, Overland Park, Kans., and William E. Thurston, Gladstone, Mo., assignors to Interconnect Devices, Inc., Kansas City, Kans.

Filed May 1, 1990, Ser. No. 517,239
Int. Cl.[5] H01R *11/18*
U.S. Cl. 439—482 **12 Claims**



1. A twisting electrical contact spring probe comprising:

(a) a substantially cylindrical barrel having a spring seating end and an open end, and four spaced crimps equally spaced about the circumference of said barrel at a location between said spring seating end and said open end said crimps forming portions of the sides of a square when said barrel is viewed in cross section;

(b) a compression spring seated in said spring seating end of said barrel;

(c) a probe seated within said barrel and retained within said barrel by said crimps, said plunger further comprising a tail section, a shank section, and a twister section between said tail section and said shank section, and four parallel equal spaced helical crests along said twister section, each said crimp engaging one said helical crest and urging rotation of said plunger as said plunger reciprocates relative to said barrel;

(d) means for alternatively admitting and expelling air from said cylinder as said plunger reciprocates in said barrel; and

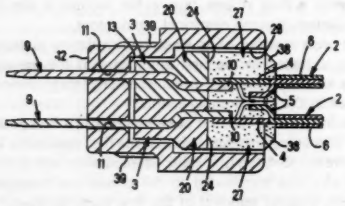
(e) tip means on said plunger for rotating with said plunger and providing a scraping action.

5,009,614

SHIELDED CABLE ASSEMBLY WITH FLOATING GROUND

Michael W. Fogg, Harrisburg; Keith S. Koegel, Linglestown; John R. Shuey, Mechanicsburg; William E. Zelko, Dauphin, and Robert E. Beamenderfer, Palmyra, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed May 31, 1990, Ser. No. 531,203
Int. Cl.[5] H01R *9/07*
U.S. Cl. 439—497 8 Claims



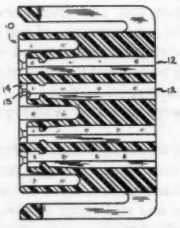
1. A cable assembly for at least one electrical cable comprising: an insulative housing block, conductive electrical contacts in the housing block connected to corresponding signal wires of the cable, a conductive ground bus connected to corresponding ground wires of the cable, plastics material at a rear of the housing block imbedding the electrical contacts and the ground bus and a portion of the cable, an insulative housing having a rear facing cavity receiving the housing block and the contacts and the plastics material, the housing having contact receiving cavities receiving corresponding contacts, a conductive shell enclosing the housing and connected to chassis ground potential, the ground bus being enclosed by the conductive shell and being isolated electrically from the shell by the plastics material in the housing, and the ground wires extending into the shell and being isolated electrically from the shell by the plastics material in the housing.

5,009,615

TERMINAL ASSEMBLY WITH FIXED AND FLEXIBLE TAB RECEPTACLE RETAINERS

Dewey F. Mobley, Lake Orion; Robert G. Peterson, Sr., Canton, and James E. LaCava, Novi, all of Mich., assignors to Interlock Corporation, Westland, Mich.

Continuation of Ser. No. 248,591, Sep. 26, 1988, abandoned. This application Jun. 27, 1990, Ser. No. 544,414
Int. Cl.[5] H01R *13/40, 13/422*
U.S. Cl. 439—595 1 Claim



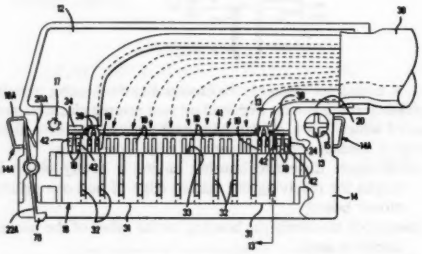
1. An electrical terminal assembly comprising:
a stationary first wall member having a first shoulder extending therefrom;
a stop shoulder having first and second ends thereon and being connected to said first wall member at said first end;
a second wall member having a plurality of slots formed therein defining a flexible finger having a second shoulder protruding therefrom, said second wall member being connected to said stop shoulder at said second end thereof, said second wall member cooperating with said first wall member and said stop shoulder to define a terminal receiving cavity, said finger being biased in a direction inwardly of said cavity and cooperating with said cavity to allow a terminal to be received thereinto, said first shoulder of said stationary first wall and said second shoulder of said biased finger being positioned inward of said cavity and coacting with the terminal to secure the terminal therein, said stop shoulder preventing further insertion of the terminal, said finger being deflectable in a direction outwardly of said cavity permitting removable of the terminal from said assembly.

5,009,616

CONNECTOR ASSEMBLY WITH BACK SHELL HAVING VANES

Michael W. Fogg, Harrisburg, and Leroy J. Morningstar, Middletown, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 14, 1989, Ser. No. 450,784
Int. Cl.[5] H01R *13/648*
U.S. Cl. 439—608 6 Claims



1. A shielded connector assembly comprises, a terminal block containing electrical contacts, a conductive back shell, at least one multiconductor cable extending through a cable receiving opening of the back shell with corresponding conductors of the cable connected to corresponding contacts, and a strain relief for the cable contained in the back shell, the improvement comprising;
the back shell separates and shields selected contacts from other contacts in the terminal block, the back shell is bipartite, and conductive vanes on both parts of the back shell extend part way through the terminal block and engage opposing vanes to provide shielding continuously through the terminal block.

5,009,617

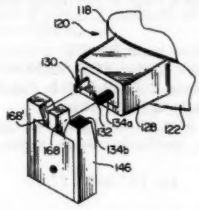
ASSEMBLY FOR A D.C. HID LAMP

Brian J. Thomas, Phoenix, N.Y., assignor to Welch Allyn, Inc., Skaneateles Falls, N.Y.

Filed Feb. 6, 1990, Ser. No. 475,933
Int. Cl.[5] H01R *13/64*
U.S. Cl. 439—679 4 Claims

1. A combination socket and lamp assembly that includes a lamp having a first rectangular shaped blade conductor and a second circular shaped cylindrical conductor, the width of the blade conductor being different from the diameter of the cylindrical conductor, a socket means having a top wall and a front wall, a pair of parallel slotted receptacles formed in said front wall that open upwardly through the top wall, a first receptacle being configured and dimensioned to mate with said first blade conductor and a second receptacle being configured and dimensioned to mate with said second cylindrical conductor so

that the lamp connectors can be slidably inserted downwardly into the slots, and electrical contact means contained within



the receptacles for transmitting electrical current through the connectors to the lamp.

5,009,618

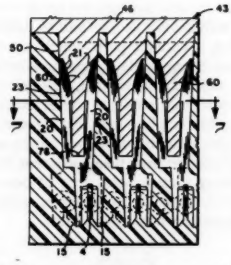
METHOD AND APPARATUS FOR MAKING ELECTRICAL CONNECTING DEVICE

Robert H. Black, Jacksonville, Fla., and John T. Venaleck, Madison, Ohio, assignors to Ohio Associated Enterprises, Inc., Painesville, Ohio

Division of Ser. No. 920,273, Oct. 17, 1986, Pat. No. 4,863,402. This application May 10, 1989, Ser. No. 349,754

Int. Cl.[5] H01R *13/405*

U.S. Cl. 439—736 **16 Claims**



1. An electrical connecting device, comprising an electrical contact and housing means for containing at least part of said contact, said housing means having opening means for receiving therein one member for contacting said contact, said contact including a base and extending from said base at least two separate resilient contacting means for contacting at inner surfaces thereof said one member inserted between said contacting means, both said contacting means being capable of outward deformation to undergo substantially independent movement during inserting of said one member therebetween, said housing means including a body molded while said contacting means are outwardly deformed to form an integral structure about and to at least part of said contact and around at least part of said two contacting means to form said opening means in said housing means between said two contacting means and open spaces formed by said contacting means when outwardly deformed and defined by spaces created when said contacting means resiliently return inwardly to an undeformed position, said open spaces being adjacent respective ones of said two contacting means to permit such outward deformation of both said contacting means for insertion of the one member between said two contacting means.

5,009,619

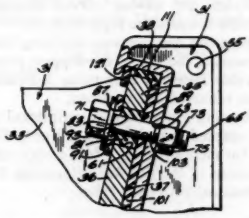
CORROSION PROTECTION SYSTEM

Peter W. Meier, Stuart, Fla., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Sep. 5, 1989, Ser. No. 402,521

Int. Cl.[5] B63H *5/12*

U.S. Cl. 440—53 **13 Claims**



1. A marine installation including a transom fabricated on a first metal and including a forward surface, a rearward surface, and a mounting opening extending between said surfaces, and a marine propulsion device including a transom bracket fabricated of a second metal less noble than said first metal, and means for detachably mounting said transom bracket on said transom and for simultaneously electrically insulating said transom bracket from said transom, said means including a sleeve fabricated of electrically insulating material and engaged in said mounting opening and having therein a bore, a sheet fabricated of electrically insulating material and engaged with said rearward surface and with said sleeve and having therein an opening in registry with said bore, a washer fabricated of electrically insulating material and engaged with said forward surface and with said sleeve and having therein an aperture in registry with said bore, and a bolt having a heat engaging said washer, extending through said aperture, through said bore, through said opening in said sheet, and connected to said transom bracket to locate said transom bracket in engagement with said sheet and in rigid assembly with and in electrical isolation from said transom.

5,009,620

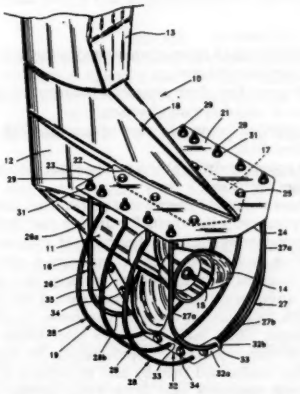
PROPELLER GUARD

Louis Feranda, Sr., 4251 W. Oquendo, Las Vegas, Nev. 89118

Filed May 24, 1990, Ser. No. 529,188

Int. Cl.[5] B63B *5/16*

U.S. Cl. 440—72 **11 Claims**



1. A propeller guard for a propeller mounted on a propeller shaft extending rearwardly from a propeller shaft housing of a

marine propulsion unit having a cavitation plate above the propeller, comprising:

(a) an elongate support plate adapted to be secured to the cavitation plate,

(b) a plurality of ribs independently suspended from the support plate,

the ribs being formed of rod members having integrally formed end portions projecting through apertures in the support plate and having curved sections extending transversely beneath the support plate,

the projecting rod end portions receiving removable fasteners securing the ribs to the support plate,

the removable fasteners permitting individual damaged ribs to be removed and replaced,

(c) the ribs forming a substantially cylindrical cage open at both ends adapted to encompass, the propeller, and

(d) elongate bar means coacting with a bight on each of the curved sections of the ribs for maintaining the latter in a parallel relationship to each other.

5,009,621

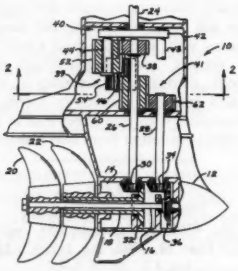
TORQUE SPLITTING DRIVE TRAIN MECHANISM FOR A DUAL COUNTERROTATING PROPELLER MARINE DRIVE SYSTEM

Herbert A. Bankstahl, Fond du Lac; Lyle M. Forsgren, Oshkosh; Neil A. Newman, Omro; Wayne T. Beck, and John M. Griffiths, both of Fond du Lac, all of Wis., assignors to Brunswick Corporation, Skokie, Ill.

Filed Mar. 20, 1989, Ser. No. 326,024

Int. Cl.[5] B63H *23/28*

U.S. Cl. 440—75 **22 Claims**



1. In a marine drive for a boat, said marine drive including an engine having a rotatable output shaft, a drive unit for driving said boat in response to rotation of said output shaft, comprising:

a drive unit housing;

a first propeller shaft rotatably mounted in the lower portion of said drive unit housing;

a second propeller shaft rotatably mounted in the lower portion of said drive unit housing;

a first propeller driving by interconnected with said first propeller shaft;

a second propeller drivingly interconnected with said seond propeller shaft; and

drive means disposed between said output shaft and said first and second propeller shafts for driving said first and second propeller shafts, and thereby said first and second propellers, said drive means comprising a pair of drive shafts mounted in said drive unit housing, and counterrotation drive means for driving said pair of drive shafts in opposite rotational directions in response to rotation of said output shaft, each said drive shaft being drivingly engaged with one of said propeller shafts for rotating said propeller shafts, and thereby said propellers, in opposite rotational directions, said drive means further including means for increasing or decreasing the rotational speed of one of said propellers in response to varying operating conditions, with a resulting decrease or increase in the rotational speed of the other of said propellers, so that the torque fraction supplied to each propeller is substantially constant under a range of operating conditions.

5,009,622

COOLING SYSTEMS FOR MARINE MOTORS

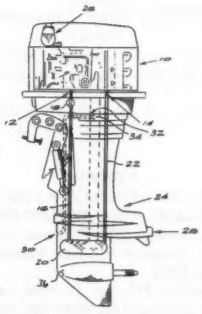
Frank A. R. Dudney, P.O. Box 413, Paarden Eiland, Cape Town, Cape Province, South Africa

Filed Mar. 12, 1990, Ser. No. 491,867

Claims priority, application South Africa, Mar. 15, 1989, 89/1964

Int. Cl.[5] B63H *21/10*

U.S. Cl. 440—88 **8 Claims**



1. A cooling system for an outboard marine motor having motor and drive housing with a lower gear box and a cavitation plate above said gear box, and an internal coolant path for conveying a liquid coolant through hot zones of the motor, the internal coolant path having an inlet and an outlet, the cooling system comprising a coolant path which is external to the motor housing and connectable across the inlet and the outlet to form with the internal coolant path, a closed coolant circuit, the external coolant path including a heat exchanged located between said cavitation plate and said gearbox so as to be under water in which the motor moves during use of the system, the external coolant path being adjacent the drive housing, and the cooling system being free of operative contact with said gear box external to the motor housing whereby the cooling system primarily cools the motor.

5,009,623

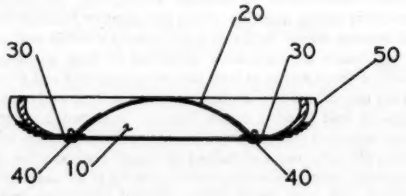
SURFING SAUCER

Jeffrey D. Lueschen, 2335 #23 Caringa Way, Carlsbad, Calif. 92009

Filed Feb. 20, 1990, Ser. No. 481,590

Int. Cl.[5] A63B *31/10*

U.S. Cl. 441—56 **1 Claim**



1. A marine propulsion device comprising:

(a) a saucer having a substantially flat circular area circumscribed by a rim with a surface of convex curvature con-

necting said central circular area to said rim to form concave and convex saucer sides;

(b) a hand strap bisecting said central circular area of said saucer which is firmly connected at both ends to the concave side of the saucer;

(c) the saucer having hydraulic flow spoiling means located on the convex surface of curvature; and,

(d) said hydraulic spoiling means being further defined as comprising a plurality of evenly spaced circular ridges concentric to the center of the saucer.

5,009,624

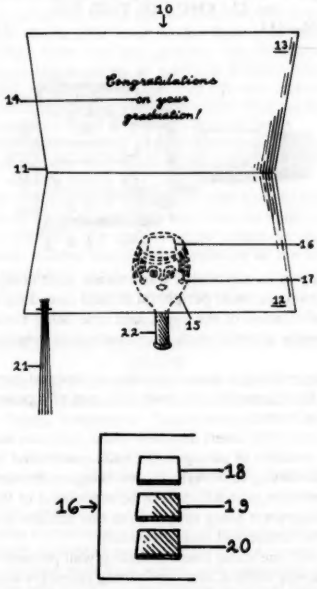
MAILABLE THREE-DIMENSIONAL GREETING DEVICE

Mailiis Estam-Goggin, 26000-L Brigadier Pl., Damascus, Md. 20872, assignor to Mailiis Estam-Goggin, Damascus, Md.

Filed Mar. 1, 1990, Ser. No. 486,890

Int. Cl.[5] A63H *33/00*; G09F *1/00*

U.S. Cl. 446—71 **20 Claims**



1. The combination of a flat piece of card stock, a flat, inflatable balloon and a triple-layered strip of sticky tapes, said strip of triple-layered sticky tapes permanently uniting said flat piece of card stock and said inflatable balloon both while said balloon is uninflated and also upon inflation of said balloon, into one physically intergrated greeting device unit.

5,009,625

BUILDING BLOCKS

Michrel S. Longuet-Higgins, 1 Branch Road, Comberton, Cambridge CB3 7DH, England

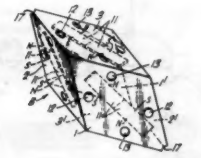
PCT No. PCT/GB88/00017, § 371 Date Aug. 1, 1989, § 102(e) Date Aug. 1, 1989, PCT Pub. No. WO88/05329, PCT Pub. Date Jul. 28, 1988

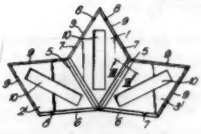
PCT Filed Jan. 12, 1988, Ser. No. 382,799

Claims priority, application United Kingdom, Jan. 13, 1987, 8700706

Int. Cl.[5] A63H *33/04*

U.S. Cl. 446—92 **13 Claims**





1. A set of building blocks which are constructed so as to be capable of being held together face to face magnetically; wherein said set includes two subsets each of blocks of the same shape but different from those of the other subset, both subsets being formed by rhombohedra having a plurality of faces, with the blocks of one subset having dihedral angles of 72° (and 108°), and the blocks of the other subset having dihedral angles of 36° (and 144°), all the faces of all said blocks having the same dimensions, and wherein each face of each block is provided with a pair of opposite magnetic poles on each side of a long diagonal of said face by opposite edges of a pair of transversely polarized magnetic strips extending along said diagonal of each said face, said strip covering an area less than the surface area of said face, whereby when two faces of different ones of said blocks are juxtaposed face to face said blocks will tend to rotate relatively to one another to one of two stable positions in which said faces are aligned.

5,009,626

HUMAN LIFELIKE DOLLS, MANNEQUINS AND HUMANOIDS AND PET ANIMAL DOLLS AND METHODS OF INDIVIDUALIZING AND PERSONALIZING SAME

Marcella M. Katz, 10573 Le Conte Ave., Los Angeles, Calif. 90024

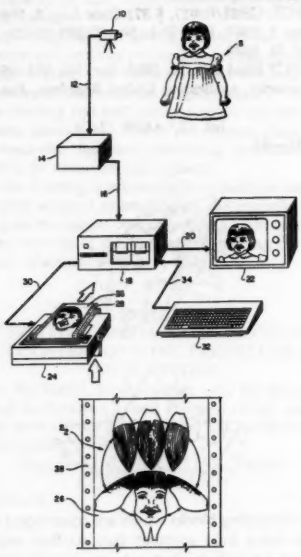
Continuation of Ser. No. 848,389, Apr. 4, 1986, abandoned. This application Jul. 25, 1988, Ser. No. 223,808

Int. Cl.[5] A63H *3/36*

U.S. Cl. 446—391 **5 Claims**

1. A three-dimensional lifelike representation of the head portion of a real life subject comprising: flexible sheet fabric material bearing on one side thereof an imprint of the head portion of a real life subject in the form of a computer-generated printed representation of the head of said subject consisting of an azimuthal-type group of connected sector photographic projections, said sheet material being of a type capable of conforming to a substrate structure; and a computer-selected substrate structure having a three-dimensional configuration and contour of head features matched to those of said subject and of a size matched to the computer-generated

printed representation of the head of said subject on said sheet material, said imprinted sheet material covering and con-



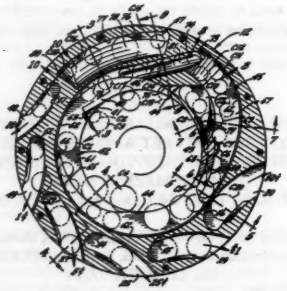
formed to said substrate structure and affixed thereto to form said lifelike representation of the head portion of said subject.

5,009,627

COIN SORTING MECHANISM

James M. Rasmussen, Chicago, Ill., assignor to Cummins-Allison Corp., Mt. Prospect, Ill.

Filed Mar. 14, 1989, Ser. No. 323,271
Int. Cl.[5] G07D *3/06*
U.S. Cl. 453—10 **14 Claims**



1. A coin sorter for sorting coins in terms of their denomination comprising:

a rotatably mounted coin-carrying disc having a resilient surface onto which coins may be fed;

means for rotating said disc;

a guide plate having a central opening and a configured surface positioned closely adjacent to said disc and covering said resilient surface, and wherein said configured surface includes an inner recess within which coins move radially, and said inner recess extends outwardly from said central opening, said guide plate forming a referencing means for receiving coins of all denominations and providing a single-file stream of the coins of all denominations positioned at a common radial location,

sorting means disposed around the outer periphery of said guide plate for receiving said single-file stream of coins and sorting the coins in said stream according to their respective denominations, and

means formed in said guide plate for breaking up stacked coins moving from said central opening toward said referencing means,

wherein said means for breaking up stacked coins includes first means for recirculating coins including coins from the stacked coins broken up by said means or breaking up stacked coins, and

wherein said referencing means includes a second means for recirculating coins including excess coins forming a stream of coins not adjacent to said referencing means, but moving to said referencing means in greater numbers than can be accommodated in said single-file stream of coins adjacent to referencing means, and

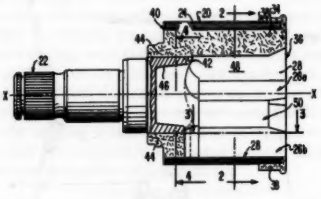
wherein said first means for recirculating coins directs coins away from the coins travelling in the said second means for recirculating coins.

5,009,628

BODY HAVING A COMPOSITE STRUCTURE FOR A TRANSMISSION JOINT AND ITS METHOD OF PRODUCTION

Michel Rouillot, Lorraine, France, assignor to Glaenzer-Spicer, Poissy, France

Filed Mar. 28, 1989, Ser. No. 329,634
Claims priority, application France, Mar. 28, 1988, 88 04045
Int. Cl.[5] F16C *3/00*; F16D *3/26*
U.S. Cl. 464—111 **17 Claims**



1. A body of an articulated transmission joint comprising:

a case having an inner peripheral surface extending about an axis of rotation of the body, said case being formed of a composite material including continuous reinforcing fibers;

connecting element means forming an integral part of the body for connecting the body to a part of a power transmission system;

at least one metal insert disposed within said case and defining a plurality of passageways, each constituted by a pair of confronting raceways, for receiving an element of the transmission joint which is to be articulated to the body,

said passageways being spaced from one another at angular intervals about said axis of rotation;

said at least one metal insert including wall portions having, on one side thereof, said confronting raceways and, on the other side thereof, confronting surfaces defining an inner space with the inner peripheral surface of said case; and

a matrix material occupying said inner space and integrating said at least one metal insert with said case,

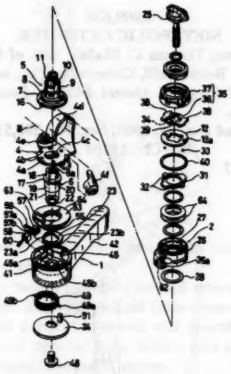
said matrix material comprising one of a thermoplastic and thermosetting resin, and reinforcing means consisting of one of short fibers and particles for reinforcing the resin.

5,009,629

SHIFT LEVER ASSEMBLY FOR BICYCLE

Koichi Tagawa, Kawachinagano, Japan, assignor to Maeda Industries, Ltd., Osaka, Japan

Filed Apr. 3, 1990, Ser. No. 503,854
Claims priority, application Japan, Apr. 5, 1989, 1-86148
Int. Cl.[5] B62M *25/00*
U.S. Cl. 474—80 10 Claims



1. A bicycle shift lever assembly for operating a derailleur by winding up or paying out a wire which connects the lever assembly to the derailleur, the lever assembly comprising:

pivot means fixedly mountable to a bicycle handlebar, the pivot means including a first pivot and a second pivot removably connected coaxially to the first pivot,

a shift lever having a boss portion rotatably fitted around the first pivot, the shift lever further having an arm portion extending from the boss portion, the shift lever being spring-biased to return to a neutral position from which the shift lever is rotatable in two opposite directions,

wire winding means provided separately from the shift lever and rotatably fitted around the second pivot,

a lever-coupled member provided between the lever boss portion and the wire winding means for rotation with the wire winding means, and

a clutch mechanism for causing the shift lever to rotate with the lever-coupled member away from the neutral position while allowing the shift lever to return to the neutral position without simultaneous rotation of the lever-coupled member.

5,009,630

CHAIN FORMED BY LINK ELEMENTS OF IDENTICAL SHAPE

Makoto Kanehira; Takerou Nakagawa; Yasumasa Tsubakimoto; Kouji Tanaka; Toshio Takahashi, and Masaaki Ikeda, all of Osaka, Japan, assignors to Tsubakimoto Chain Co., Osaka, Japan

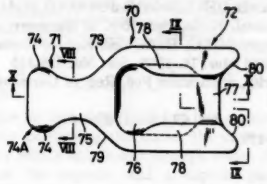
Filed Sep. 22, 1989, Ser. No. 411,555
Claims priority, application Japan, Oct. 21, 1988, 63-264199
Int. Cl.[5] F16G *13/02*
U.S. Cl. 474—211 9 Claims

1. A chain comprising a plurality of ceramic link elements, each of which includes a main body part and a connecting part integrally formed with each other, said connecting part projecting from said body part and having a curved surface head portion and a reduced neck portion;

the main body part having, at its point of connection to the neck portion, inclined end surfaces which converge inwardly toward one another for connection to the neck portion;

said main body part including (1) a recess for receiving said curved surface head portion of an adjacent said link element and (2) a narrowed slot portion for receiving said neck portion of the adjacent link element, said narrowed slot portion being contiguous with said recess at an end of said recess opposite said connecting part;

said main body part also including confining sections covering a portion of said recess, said confining sections projecting from both sides of said recess adjacent said narrowed slot portion in the form of overhanging eaves, whereby the connecting part of the adjacent link element is inserted in a first direction into said recess of a first said link element so that the head portion is brought beneath the confining sections, and then said neck portion of the



adjacent link element is received by said narrowed slot portion of the first link element as the adjacent link element is pivoted about its connecting part to extend in a second direction wherein the joined link elements are substantially aligned; and

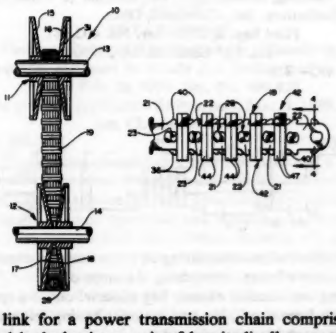
said main body part adjacent the outer end of said narrowed slot portion having inwardly converging end surfaces which are inclined substantially the same as and complimentary to the first-mentioned end surfaces, the first-mentioned inclined end surfaces of said adjacent link element abutting against the second-mentioned inclined end surfaces of said first link element when the chain is subjected to a pushing force.

5,009,631

CVT CHAIN-BELT

John S. Ivey, Ithaca; Paul M. Bateman, Freeville; Julius A. Clauss; Edward H. Cole, Jr., both of Ithaca, and Philip J. Mott, Dryden, all of N.Y., assignors to Borg-Warner Automotive, Inc., Troy, Mich.

Division of Ser. No. 356,617, May 23, 1989, which is a continuation of Ser. No. 114,335, Oct. 28, 1987, abandoned. This application Oct. 3, 1989, Ser. No. 416,704
Int. Cl.[5] F16G *13/02*
U.S. Cl. 474—213 3 Claims



1. A link for a power transmission chain comprising an elongated body having a pair of longitudinally spaced apertures adjacent the opposite ends thereof, each aperture having a generally hour-glass shape with enlarged rounded ends joined by an intermediate neck portion,

an angularly inclined upper surface extending from a first

end and terminating in a first outwardly extending tab adjacent said first end of the link and generally laterally aligned with the aperture at said first end,

an inwardly curved lower surface extending from said first end and terminating in a second outwardly extending tab adjacent said first end of the link and generally laterally aligned with the aperture at said first end, said first and second tabs being oppositely disposed,

each tab having a rounded end surface, a flattened rear surface and an undercut corner substantially aligned with an edge of said first aperture.

5,009,632

METHOD AND DEVICE FOR JOINING FOIL HOSES

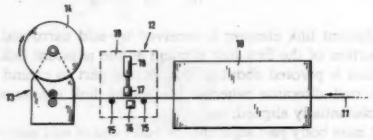
Bernhard Kruessel, Halle, Fed. Rep. of Germany, assignor to Karl H. Sengewald KG, Halle, Fed. Rep. of Germany

Filed Mar. 16, 1989, Ser. No. 324,316

Claims priority, application Fed. Rep. of Germany, Mar. 18, 1988, 3809125

Int. Cl.[5] B31B *23/74*

U.S. Cl. 493—189 7 Claims



1. A method for joining a first tubular web and a second tubular web, each tubular web defining a plurality of bag portions having a predetermined pitch substantially defining a bag length and each tubular web having an end portion including at least one transverse weld, the method comprising the steps of:

superimposing the transverse weld at the end portion of the first tubular web and the transverse weld at the end portion of the second tubular web, and

joining the superimposed transverse welds by a joining weld, the joining weld being substantially coincident with the superimposed transverse welds,

whereby the first tubular web and the second tubular web are joined to produce a joined tubular web having bag portions of substantially uninterrupted pitch.

5,009,633

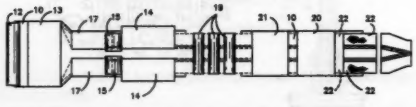
METHOD OF MANUFACTURING AN OUTER VACUUM CLEANER BAG FOR AN UPRIGHT CLEANER

Oral M. Smaling, Bloomington, Ill., assignor to White Consolidated Industires, Inc., Cleveland, Ohio

Filed Sep. 5, 1989, Ser. No. 402,647

Int. Cl.[5] B31B *23/68, 23/90*

U.S. Cl. 493—214 7 Claims



1. A method of manufacturing an outer vacuum cleaner bag for a vacuum cleaner, comprising the steps of:

drawing out vacuum cleaner bag material cut to a specified width from a roll, the bag material having left and right sides, each having a side edge;

folding the side edges of the bag material;

providing zipper halves on the right and left sides of the bag material;

feeding the bag material into a double-headed sewing machine with each of the heads on the sewing machine engaging one of the sides of the bag material;

feeding each of the zipper halves into the respective head of the sewing machine and sewing the zipper halves on the right and left hand side edges of the bag material to form a bag assembly; and

feeding the bag assembly into a cutting press using an automatic incremental feed apparatus whereby the bag material is cut into panels.

5,009,634

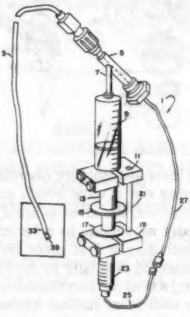
METABOLIC CATHETER

Marc D. Feldman; Thomas C. Skalak, both of Charlottesville, Va., and Luiz Belardinelli, Gainesville, Fla., assignors to The University of Virginia Alumni Patents Foundation, Charlottesville, Va.

Filed Jan. 11, 1989, Ser. No. 295,517

Int. Cl.[5] A61M *1/00*

U.S. Cl. 604—27 17 Claims



1. A metabolic catheter comprising:

(a) a withdrawal catheter having proximal and distal ends;

(b) an infusion catheter having proximal and distal ends, wherein the infusion catheter is inserted within the withdrawal catheter and positioned so that the distal end of the infusion catheter is near the distal end of the withdrawal catheter and provides a space between distal ends of the withdrawal and infusion catheters;

(c) first and second syringes, wherein the first syringe is attached to the proximal end of the withdrawal catheter and the second syringe is attached to the proximal end of the infusion catheter, wherein plungers of the first and second syringes are fastened together end-to-end and are mounted; and

(d) a first stop solution which is placed into the second syringe attached to the infusion catheter, wherein the metabolic catheter further comprises a second stop solution which is placed into the first syringe attached to the withdrawal catheter.

5,009,635

PUMP APPARATUS

Eugene N. Scarberry, Trafford, Pa., assignor to Respironics Inc., Murrysville, Pa.

Filed Nov. 6, 1989, Ser. No. 432,159

Int. Cl.[5] A61M *1/00*

U.S. Cl. 604—27 13 Claims

1. A stomach pump or the like comprising:

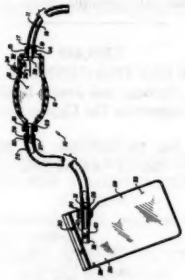
a resiliently flexible bulb means enclosing an interior space and having an outlet and an inlet communicating between said interior space and the exterior of said bulb means;

first one-way flow check valve means disposed in fluid flow communication with said inlet and operable to preclude material movement from said interior space via said inlet;

first connector means disposed adjacent said outlet;

a remote reservoir means for receiving material therewithin and including a second connector means disposed in fluid flow communication therewith to permit movement of material into said reservoir means;

selectively releasable means connecting said first and second connector means to permit material to move from said



interior space of said bulb means into said remote reservoir means; and

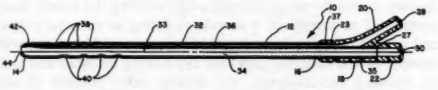
said reservoir means including second one-way flow check valve means disposed in fluid flow communication with said second connector means and operable to preclude movement of material from within said reservoir means via said second connector means.

5,009,636

DUAL-LUMEN CATHETER APPARATUS AND METHOD

Ronald W. Wortley, and David C. Beattie, both of Salt Lake City, Utah, assignors to The Kendall Company, Boston, Mass.

Filed Dec. 6, 1989, Ser. No. 446,971
Int. Cl.[5] A61M *5/00*
U.S. Cl. 604—43 **11 Claims**



1. An extracorporeal oxygenation catheter apparatus designed for simultaneous withdrawal of blood to be oxygenated by means of gravity drainage and pressurized return of blood that has been oxygenated, comprising:

an elongated catheter body having a distal end and a proximal end, and comprising a septum means for forming a first and a second lumen through the interior of said catheter body, said first lumen comprising a cross-sectional area sized so that a sufficient volumetric flow rate for purposes of oxygenation of said blood will occur in said first lumen as a result of gravity drainage of blood through the first lumen, and said second lumen comprising a cross-sectional area which is smaller in relation to said cross-sectional area of the first lumen but which is also sized so that a substantially equal volumetric flow rate of said oxygenated blood is returned under pressure through said second lumen, each said lumen comprising an opening means for passage of blood therethrough at said stated volumetric flow rate; and

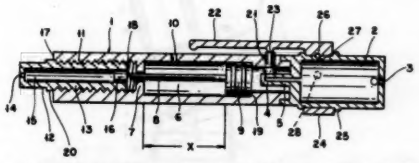
connector means joined to said proximal end for attaching said catheter body to tubing, said connector means comprising means forming a first passageway for connection to tubing through which said blood to be oxygenated is withdrawn from said first lumen, and means forming a second passageway for connection to other tubing through which said oxygenated blood is returned to said second lumen.

5,009,637

APPARATUS FOR HYPODERMIC INJECTION OF LIQUIDS

Jack Newman, Queenscliff, and James A. Monroe, Turramurra, both of Australia, assignors to Sy-Quest International Limited, Woolahra, Australia

Filed Nov. 16, 1988, Ser. No. 272,121
Claims priority, application Australia, Nov. 16, 1987, PI5441
Int. Cl.[5] A61M *5/30*
U.S. Cl. 604—68 **9 Claims**



1. A device for introducing a liquid into a patient, including:

a capsule for containing the liquid, the capsule including a hollow body with a nozzle end through which the liquid exits from within the capsule, and a capsule piston movably mounted within the body and operable to push the liquid out through said nozzle end;

a body providing a reservoir for receiving a quantity of gas under pressure from a gas source;

an interacting actuator piston and cylinder assembly, within the body, providing a variable volume space behind the actuator piston;

a neck, having a closed end, extending from said reservoir to said space behind the actuator piston;

means operable by a user to open said closed end to permit said quantity of gas to pass from said reservoir to said space behind the actuator piston to cause movement of said actuator piston within said cylinder;

a piston rod extending from said actuator piston towards an anterior end of the body and engageable with the said capsule piston to cause movement thereof upon said quantity of gas under pressure being delivered to said space behind the actuator piston;

a casule mounting means, at the anterior end of the body, to connect the capsule to the body while allowing the capsule to be axially moveable along the anterior end so that the distance between the capsule piston and a front end of the piston rod can be varied so that the amount of penetration of the piston rod into the capsule, upon movement of the actuator piston, may be adjusted to vary the amount of liquid expelled from the capsule.

5,009,638

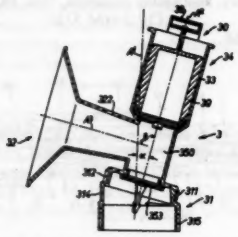
BREAST PUMP

Robert Riedweg, Eich, and Klaus Schlensog, Hünenberg, both of Switzerland, assignors to Ameda AG, Switzerland

Filed Feb. 28, 1990, Ser. No. 486,418
Claims priority, application Switzerland, Mar. 1, 1989, 751/89
Int. Cl.[5] A61M *1/06*
U.S. Cl. 604—74 **10 Claims**

1. A breast pump comprising a milk reservoir and a closure member for connection with said reservoir; said closure member comprising a suction bell and a suction pump suitable for single-handed manual operation and including: (a) a cylinder integrally connected with said closure member; (b) a piston means for reciprocating motion within said cylinder between a first or lower position and a second or upper position, and (c) a spring-loaded actuator for interaction with said piston means; wherein said actuator is formed by a yoke means comprising an elongated spring member having a first or normal position and being reversibly deformable into a second or elastically bent position, said spring member having two ends and being connected with said piston means substantially intermediate between said two ends, and said yoke further comprising a pair of

elongated lateral legs each having a lower end and an upper end, each of said lower ends being connected with an anchoring member on said closure member, each of said upper ends of said elongated lateral legs being connected with said spring member near one of said two ends thereof, said yoke means being dimensioned for single-handed manual compression of



said lateral legs and for elastically deforming said spring member by said compression so as to upwardly displace said piston means within said cylinder upon said manual compression and permitting said spring member to revert into its first or normal position when said lateral legs are released from said manual compression for returning said piston means into said first or lower position.

5,009,639

GASTRIC/DUODENAL/JEJUNAL CATHETER FOR PERCUTANEOUS ENTERNAL FEEDING

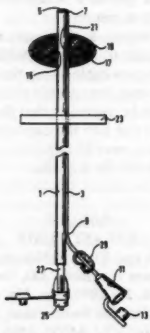
Michael Keymling, Bad Hersfeld, Fed. Rep. of Germany, assignor to Fresenius, AG, Bad Homburg, Fed. Rep. of Germany

Filed Apr. 22, 1988, Ser. No. 184,628

Claims priority, application Fed. Rep. of Germany, Apr. 23, 1987, 8705894[U]

Int. Cl.[5] A61M *25/00*

U.S. Cl. 604—96 **4 Claims**



1. In a gastral/duodenal/jejunal catheter for percutaneous enteral feeding comprising:

a first catheter hose having a first channel for the delivery of a feeding solution,

a second hose having a channel for the provision of a filling medium, both said hoses having proximal inflow and distal outflow ends,

a balloon through which said first and second hose pass, wherein the junction between said balloon and said hoses is sealed to be impervious to gas and liquid, said balloon being located close to the distal end of said first hose and the distal end of said second hose being sealed but having an opening into the inside of said balloon,

the improvement comprising

(a) providing said balloon, when inflated, to be substantially ellipsoid in shape a short axis of said ellipsoid substantially coaxial with the longitudinal axis of said first catheter hose, said balloon being filled with an elastic, compressible, substantially ellipsoidal foam filling, said foam filling being substantially collapsible upon the extraction of air from the balloon,

(b) further comprising a slidable disc, surrounding and slidable on said first and said second hoses locatable between said balloon and said proximal ends.

5,009,640

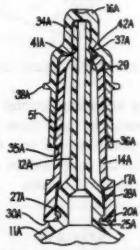
SLIP CAP FOR CANNULA USE

Thomas W. Pyret, Portage, and James L. Gallagher, Oshtemo, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Jan. 19, 1989, Ser. No. 300,278

Int. Cl.[5] A61M *5/00*

U.S. Cl. 604—117 **18 Claims**



16. An applicator for administering a mastitis treatment medication to a cow, comprising: a syringe having an axially elongated, blunt-tipped cannula extending therefrom, said cannula having an axially inner portion and an axially outer portion; a two-part, tubular, cap system releasably connected to and covering said cannula, said cap system comprising an axially inner base cap and an axially outer tip cap, said base cap having an axially elongated sidewall covering the axially inner portion of said cannula, a snap-lock fitting at an axially inner end of said base cap for releasably securing said base cap with respect to said cannula, said base cap having an outer end with an opening therethrough, the axially outer portion of said cannula extending through said opening and projecting outwardly beyond said outer end of said base cap, said tip cap comprising an axially inner, relatively wide, first sleeve portion having an axially inner end and an axially outer end, a cylindrical skirt extending axially inwardly from the axially inner end of said first sleeve portion and surrounding said base cap for a portion of the length thereof, said skirt constituting an axial extension of said first sleeve portion, an axially outer, relatively narrow, second sleeve portion covering the axially outer portion of said cannula and a laterally extending shoulder extending between adjacent ends of said first and second sleeve portions and abutting against the outer end of said base cap, said second sleeve portion having an internal sealing ring projecting laterally inwardly from an internal wall of said second sleeve portion, said sealing ring being pressed into an exterior sidewall of said outer portion of said cannula and resiliently deforming the exterior sidewall of said outer portion of said cannula to form a complementary groove therein so that said sealing ring is in releasable sealing engagement with said groove in said exterior sidewall of said outer portion of said cannula in order to prevent leakage of fluid therebetween; a laterally outwardly projecting, manually engageable, annular flange at the juncture of said skirt and said first sleeve portion, said skirt and said first sleeve portion having internal walls laterally outwardly spaced from an external wall of said base cap to provide an annular clearance space therebetween extending from adjacent to an axially inner end of said skirt to said shoulder, said flange being engageable by a finger or

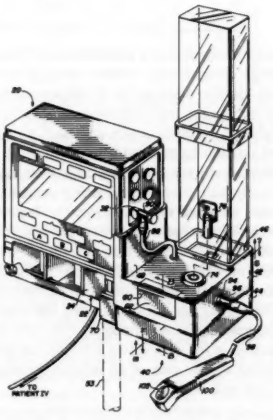
thumb of a user of the applicator so that said tip cap can be displaced from said base cap to expose said outer portion of said cannula, said cylindrical skirt covering said portion of the length of said base cap so that the user's finger or thumb does not contact said base cap or said outer portion of said cannula while said tip cap is being removed whereby to reduce the possibility of contamination of said outer portion of said cannula; and a releasable snap lock connection between the axially inner end of said skirt and an opposing portion of said base cap.

5,009,641

PATIENT-CONTROLLED ANALGESIA SECURITY ATTACHMENT FOR A MEDICATION INFUSION SYSTEM

Lanny A. Gorton, Sunland, Calif., assignor to Pacesetter Infusion, Ltd., Sylmar, Calif.

Filed Dec. 2, 1988, Ser. No. 279,466
Int. Cl.[5] A61M *5/00*
U.S. Cl. 604—131 **24 Claims**



1. An instrument for securely storing fluid medication for use in an infusion pump having a housing and using a replaceable cassette having a fluid inlet and a fluid outlet, comprising:

a first housing member;

means for attaching said first housing member to said infusion pump housing;

a second housing member, said first and second housing members defining a space therebetween, said second housing member being moveable between a first position allowing access to said space defined by said first and second housing members and a second position preventing access to said space defined by said first and second housing members;

means for receiving a container in which said fluid medication is stored, said receiving means being mounted on said first housing member;

first locking means for preventing said first housing member from being removed from said infusion pump;

second locking means for preventing said receiving means from being removed from said first housing member; and

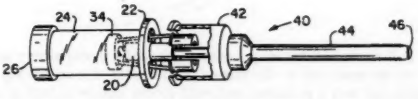
third locking means mounted on said second housing member for preventing a cassette from being removed from said infusion pump when said second housing member is in said second position.

5,009,642

SELF-BLUNTING NEEDLE ASSEMBLY FOR USE WITH A CATHETER, AND CATHETER ASSEMBLY USING THE SAME

Carl R. Sahi, Coventry, Conn., assignor to Bio-Plexus, Inc., Tolland, Conn.

Continuation-in-part of Ser. No. 101,610, Sep. 28, 1987, Pat. No. 4,828,547. This application May 8, 1989, Ser. No. 348,711
Int. Cl.[5] A61M *5/32*
U.S. Cl. 604—158 **12 Claims**



1. A catheter assembly comprising:

(a) a catheter having a hub within which is formed a hub chamber, and a catheter tube extending from the hub and terminating in a tube tip, the tube having a tube bore extending therethrough;

(b) a needle assembly carried by the catheter and comprising a needle member in which is mounted a blunting member,

(i) the needle member comprising a needle shaft having a needle bore extending therethrough, the needle shaft terminating at one end in a puncture tip and having an opposite, proximal end on which is carried a connector means,

(ii) the blunting member comprising an elongate probe having a retainer means carried thereon, the probe being slidably mounted within the needle bore with the retainer means carried exteriorly of the needle bore and the connector means and in engagement with the connector means,

(iii) the needle member being axially movable relative to the blunting member, from a retracted condition of the blunting member, in which the probe is short of the puncture tip of the needle member, to an extended condition of the blunting member, in which the probe protrudes outwardly of, and thereby blunts, the puncture tip;

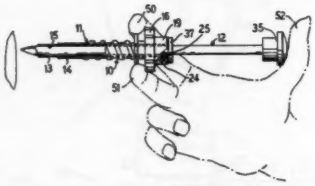
the retainer means being force-fit within the hub chamber to hold the needle assembly in place within the catheter and so positioned that (1) the needle shaft is disposed within the tube bore with the puncture tip thereof extending outwardly of the tube tip, and (2) the needle member is accessible from exteriorly of the catheter at the hub; the retainer means and the connector means being dimensioned and configured to provide a lost motion connection between the needle member and the blunting member, whereby an initial stage of withdrawal of the needle member from the catheter moves the needle member relative to the blunting member to change the blunting member from its retracted condition to its extended condition, thereby blunting the puncture tip, and continued withdrawal of the needle member beyond the initial stage overcomes the force-fit between the retainer means and the hub chamber and extracts the needle assembly from the catheter, wherein the connector means comprises a ferrule slide and the retaining means comprises a clamping member which imposes a pressure grip on the ferrule slide, whereby the lost motion is attained by overcoming the pressure grip to slide the ferrule slide through the clamping member.

5,009,643

SELF-RETAINING ELECTRICALLY INSULATIVE TROCAR SLEEVE AND TROCAR

Harry Reich, Kingston, Pa., and Peter Koch, Schiller Park, Ill., assignors to Richard Wolf Medical Instruments Corp., Rosemont, Ill.

Filed Aug. 9, 1989, Ser. No. 391,413
Int. Cl.[5] A61M 5/178
U.S. Cl. 604—165 9 Claims



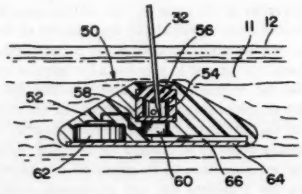
1. A device comprising a combination of a trocar sleeve and a trocar received in the sleeve, said trocar sleeve having a distal end and a proximal end, said trocar sleeve including an insulative sleeve with an inner diameter extending through the trocar sleeve to insulate a metal portion of the trocar sleeve from an instrument being inserted through the trocar sleeve, said trocar sleeve, adjacent the proximal end, having an enlarged annular flange of a first diameter and a small annular stop with a second diameter less than the first diameter being spaced toward the distal end from said annular flange, said trocar sleeve having means to prevent the removal of the sleeve from a patient being disposed on an exterior surface of the sleeve to extend from said stop toward the distal end, said means comprising a helical thread extending from the stop toward the distal end and terminating prior to reaching said distal end so that a portion of the trocar sleeve at the distal end is free of said helical thread; said trocar having a distal end with a cutting edge and a proximal end with a knob, said trocar having a stop disposed between said ends and, at a distance from said distal end, which distance is slightly greater than the length of the sleeve so that with the trocar inserted in the sleeve with the stop of the trocar engaging the proximal end of the sleeve, the cutting edge of the trocar extends out of the distal end of the trocar sleeve.

5,009,644

NEEDLE PLACEMENT VERIFIER

Ray S. McDonald, St. Paul, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Filed Jul. 25, 1989, Ser. No. 385,132
Int. Cl.[5] A61M 5/32
U.S. Cl. 604—175 5 Claims



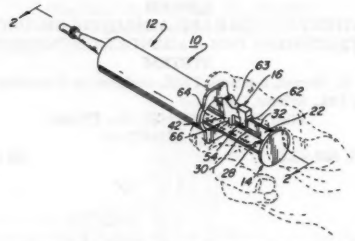
1. An implantable medical device comprising:
contact means for sensing contact with a percutaneous medical instrument including conductive contact means for contacting the medical instrument;
means for providing power which is electrically connected to the contact means;
means for generating an audible signal which is electrically connected to the contact means; and
a conductive plate mounted on the device in contact with the patient's body and electrically connected to the contact means so that an electrical circuit includes a path from the plate through the body, through the medical instrument and back to the contact means.

5,009,645

SYRINGE FOR DISPENSING MEASURED QUANTITIES OF A MATERIAL

Jules Silver, 7 Ridgewood Rd., Niantic, Conn. 06357, and Richard A. Tarozzi, 8 Oakwood Dr., Gales Ferry, Conn. 06335

Filed Jun. 12, 1989, Ser. No. 365,285
Int. Cl.[5] A61M 5/00
U.S. Cl. 604—207 19 Claims



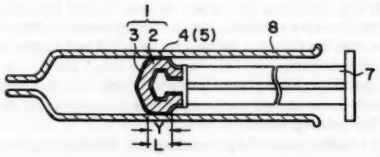
1. A syringe for dispensing a predetermined dosage of material, said syringe comprising a hollow syringe barrel having a discharge end for the material to be dispensed and an open, opposite end, a plunger rod slidably received in said syringe barrel through said open, opposite end, said plunger rod having a first end portion located within said syringe barrel and a rail section having at least a portion thereof located outside of said syringe body, said plunger rod being movable in a downstream direction into said syringe barrel for dispensing a material through the discharge end of said syringe barrel, a stop member attached to the rail section in a region outside of said syringe barrel and being axially movable along the length of the rail section to set the length of travel of the plunger rod in said downstream direction for controlling the volume of material to be dispensed, characterized in that the stop member includes a knife edge for embedding into the rail section to lock the stop member in any one of an infinite number of desired positions on said rail section.

5,009,646

SLIDING STOPPER FOR A SYRINGE

Masamichi Sudo, and Tamotsu Okuda, both of Tokyo, Japan, assignors to Daikyo Gomu Seiko Ltd., Tokyo, Japan

Filed Mar. 14, 1989, Ser. No. 324,037
Claims priority, application Japan, Mar. 16, 1988, 63-33730
Int. Cl.[5] A61M 5/315
U.S. Cl. 604—230 4 Claims



1. A sliding stopper for a syringe, consisting of a rubber elastic body having a part to be contacted with a liquid medicament and a part slidable on the inner wall of a barrel fully laminated with a resin film having a small friction coefficient, the ratio of the length (Y) of the surface of the outer circumferential part of the sliding stopper contacting the inner wall of the barrel to the length (L) of the slidable part of the sliding

stopper, Y/L being in the range of 0.8 to 1, and the ratio of the length (L) of the slidable part of the outer diameter (D) of the sliding stopper L/D being in the range of 0.25 to 1.

5,009,647

WATER CLOSET DISPOSABLE OSTOMY BAGS AND MATERIALS

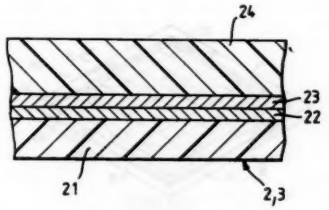
David E. Cross, Rustington; Kenneth J. Brooks, Lancing, and Neil A. Whiteside, Worthing, all of England, assignors to Smiths Industries Public Limited Company, London, United Kingdom

Continuation of Ser. No. 147,425, Jan. 25, 1988, abandoned. This application Feb. 6, 1990, Ser. No. 474,664

Claims priority, application United Kingdom, Feb. 19, 1987, 8703874

Int. Cl.[5] A61F 5/44

U.S. Cl. 604—332 **4 Claims**



1. An ostomy bag that is disposable in a w.c. by addition of an alkali to the bag or w.c., the bag comprising a flexible wall having an opening therein through which body waste material, in use, enters the bag and is contained thereby; said flexible wall comprising an inner layer disposed on an inner side of the bag, said inner layer being undamaged by the contents of the bag, and an outer layer disposed on an outer side of the bag, both of said inner and outer layers being of material that is broken up on contact with alkali, said material including carboxylated acrylic acid; at least two separately vapor diposited layers of aluminum intermediate said inner and outer layers, the thickness of each aluminum layer by itself being insufficient to prevent odor transmission but said layers in combination being effective substantially to prevent odor transmission through said wall to an extent greater than would be produced by a single aluminum layer equal in thickness to the total thickness of the two aluminum layers, and the two layers of aluminum being exposed to attack by said alkali through said wall after break up of said inner or outer layer and being soluble in said alkali.

5,009,648

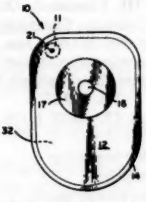
STARCH CONTAINING FILM OSTOMY POUCHES

Marvin S. Aronoff, New York; Denis E. Keyes, Staten Island, both of N.Y., and Robert C. Hahn, Sr., East Brunswick, N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Mar. 22, 1989, Ser. No. 327,469

Int. Cl.[5] A61F 5/44

U.S. Cl. 604—332 **15 Claims**



1. An ostomy pouch comprising a first front panel and a second rear panel sealed together along at least a portion of their periphery to form said pouch, said first front panel having an aperture providing access to the pouch interior for the stoma of the user, both said first front panel and said second rear panel formed of a composite film comprising a starch containing blended polymeric film coated on one surface with a barrier of polyvinylidene chloride and a ply of water absorbent or waterproof tissue paper laminated to the other surface of said starch containing blended polymeric films, said tissue paper plies constituting the exterior surface of said pouch, an adhesive label affixed to the tissue paper ply of said first front panel around said stomal aperture, and wherein said starch blended polymeric films comprise from about 15% to about 25% by weight of hydrophobic starch, ethylene vinyl acetate wherein each starch blended polymeric film contains from about 15% to about 20% by weight of vinyl acetate, up to 35% by weight of low density polyethylene, and from about 2% to about 6% by weight of an unsaturated vegetable oil.

5,009,649

EXPANDABLE BANDED MALE URINARY INCONTINENCE CONDOM AND SUPPORTING UNDERGARMENT

Victor Goulter, and Barbara Goulter, both of 485 Molimo Dr., San Francisco, Calif. 94127

Filed Jul. 13, 1989, Ser. No. 379,105

Int. Cl.[5] A61F 5/44

U.S. Cl. 604—351 **8 Claims**

1. A method for enabling a urine-incontinent male to carry voided urine conveniently until he can dispose of same, comprising:

fitting a condom having a closed distal end and an open proximal end over at least the distal end of the penis of a wearer, at least the distal end portion of said condom being sufficiently flexible, stretchable, and expandable that when said condom is fitted over said penis and affixed to said penis above said distal end portion of said penis and urine is introduced between said closed distal end portion of said condom and the distal end of said penis, said urine will force said closed distal end portion of said condom to stretch and expand to a larger diameter and away from said distal end of said penis so as to be able to retain at least 100 grams of urine in said closed distal end portion of said condom,

securing said condom to said penis above said distal end of said penis so that said condom will remain on said penis even when said urine fills and forces said distal end portion to stretch and expand, and said condom has no support other than said securing means, and

providing an undergarment containing a pouch in a symmetrical location with respect to said wearer's legs for supporting said condom when it is filled with urine.

5,009,650

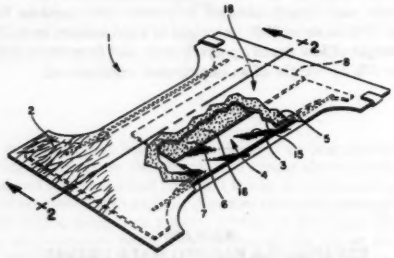
ABSORBENT STRUCTURE DESIGNED FOR ABSORBING BODY FLUIDS

Leo J. Bernardin, Appleton, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Continuation of Ser. No. 886,780, Jul. 17, 1986, Pat. No. 4,699,619, which is a continuation-in-part of Ser. No. 656,384, Aug. 31, 1984, abandoned, which is a continuation-in-part of Ser. No. 599,882, Apr. 13, 1984, abandoned. This application Aug. 6, 1987, Ser. No. 83,475

Int. Cl.[5] A61F *13/16*

U.S. Cl. 604—378 28 Claims



1. A disposable, absorbent structure suitable for use in an absorbent article, said absorbent structure having end edges at the opposite ends of the length of the absorbent structure, said absorbent structure comprising:

(A) an upper layer having a density in the range of about 0.03 to about 0.4 gram per cubic centimeter and consisting essentially of fiber material, which in batt form has a capacity for absorbing fluids; and

(B) a lower layer in direct fluid communication with the upper layer and having a density in the range of about 0.14 to about 0.3 gram per cubic centimeter and comprising preponderantly a mixture of fiber material, which in batt form has a capacity for absorbing fluids, and superabsorbent material;

said lower layer further being positioned relative to said upper layer in a manner such that superabsorbent material in said lower layer is located more towards one of said end edges than the other.

5,009,651

SURFACE MATERIAL FOR SANITARY ARTICLES AND ITS PREPARING METHOD

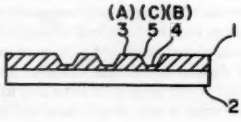
Nobuyuki Kamishioiri; Manabu Kaneda; Toshiyasu Tanaami, and Miho Maeda, all of Tochigi, Japan, assignors to Kao Corporation, Tokyo, Japan

Filed Aug. 18, 1989, Ser. No. 395,579

Claims priority, application Japan, Sep. 6, 1988, 63-223282

Int. Cl.[5] A61F *13/15*

U.S. Cl. 604—378 11 Claims



1. A surface material for sanitary articles which has the characteristic of being composed of Layer 1, which is located on the surface adapted to be in contact with the skin, and Layer 2, which is formed into a single unit with Layer 1 on the surface opposite of that which is adapted to be in contact with the skin with its entire surface being essentially covered by Layer 1, and with Layer 1 comprising 50 to 100% of hydrophobic fibers and Layers 2 comprising 50 to 100% of hydrophilic fibers, and moreover, in which at least the portion of Layer 1 covering Layer 2 has an embossed structure and possesses a first section having a given fiber density, a second section of which the fiber density is higher than said given fiber density, and a third section which is located at a boundary between said first and second sections, where the area of the third section occupies 2–50% of the area of the entire surface material.

5,009,652

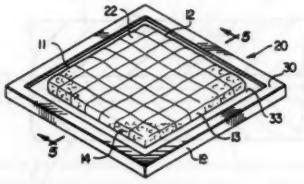
MEDICAL SPONGES AND WIPES WITH A BARRIER IMPERMEABLE TO INFECTIOUS AGENTS

Cheryle I. Morgan, 6562 Patrick Dr., Dallas, Tex. 75214, and Millard M. Judy, 5740 Palo Pinto Dr., Dallas, Tex. 75206

Filed Oct. 16, 1987, Ser. No. 109,571

Int. Cl.[5] A61F *13/15*

U.S. Cl. 604—385.1 5 Claims



1. A laminated medical sponge, comprising:

a thin and flexible sheet, having a top side and a bottom side, impermeable to infectious agents;

an integral peripheral ridge means on at least one side of said sheet and surrounding the entire peripheral edges of said sheet;

a first layer of absorbent material, having a top surface and a bottom surface and being of a smaller area than said sheet, one said surface of is secured on one side, the wiping side, of said sheet, and having the entire peripheral edges of said first layer spaced inwardly away from the entire said peripheral ridge of said sheet providing a surrounding moat of said sheet alone so that any liquid on said first layer of absorbent material cannot travel through said surrounding moat or wick around said peripheral ridge to reach the opposite side of said sheet adapted to be grasped by being gripped between one's fingers around the central region of said sheet; and

a second layer of absorbent material, having a top surface and a bottom surface and being of a smaller area than said sheet, one said surface of is secured on the opposite side, the grasping side, of said sheet, and having the entire peripheral edges of said second layer spaced inwardly away from the entire said peripheral edges of said sheet providing a surrounding area of said sheet alone.

5,009,653

THIN, FLEXIBLE SANITARY NAPKIN

Thomas W. Osborn, III, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 293,606, Jan. 4, 1989, Pat. No. 4,950,264, which is a continuation-in-part of Ser. No. 175,559, Mar. 31, 1988, abandoned. This application Aug. 20, 1990, Ser. No. 570,231

Int. Cl.[5] A61F *13/16*

U.S. Cl. 604—385.1 12 Claims

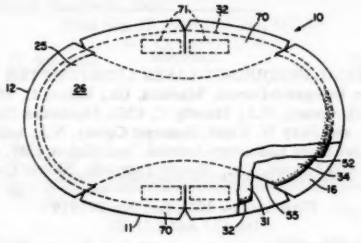
1. A sanitary napkin comprising:

a liquid permeable topsheet;

a liquid impermeable barrier sheet;

an absorbent core intermediate said topsheet and said barrier sheet;

said sanitary napkin having a test capacity of at least about 8.0 grams, a total capacity of at least about 14.0 grams, and



an absorbent portion with a flexure resistance less than about 300 grams.

5,009,654

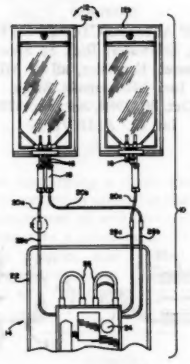
STERILE PRODUCT AND METHOD FOR STERILIZING AND ASSEMBLING SUCH PRODUCT

Billy W. Minshall, Mission Viejo, Calif.; Kailash Purohit, Winnetka; John E. Nygard, Skokie, both of Ill.; Kwame Sintim-Damoa, Vernon Hills, Ill.; Richard Giesler, Deerfield, Ill., and Archie Woodworth, Barrington, Ill., assignors to Baxter International Inc., Deerfield, Ill.

Filed Mar. 10, 1989, Ser. No. 321,698

Int. Cl.[5] A61B *19/00*

U.S. Cl. 604—410 **20 Claims**



1. A method for assembling a sterile product having at least two parts, comprising;

sterilizing the first part of said product;

isolating a selected portion from the remainder of said first part;

attaching a second part of said product to said selected portion;

exposing said selected portion to an electron beam sufficient to effect sterilization of said portion; and

shielding the remainder of said first part from the radiation of said electron beam.

5,009,655

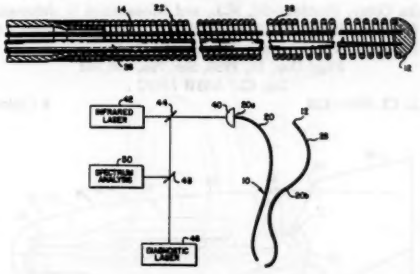
HOT TIP DEVICE WITH OPTICAL DIAGNOSTIC CAPABILITY

Kenneth J. Daignault, Jr., Jefferson; Edward I. McNamara, Chelmsford, and Edward L. Sinofsky, Peabody, all of Mass., assignors to C. R. Bard, Inc., Murray Hill, N.J.

Filed May 24, 1989, Ser. No. 356,437

Int. Cl.[5] A61B *5/06*

U.S. Cl. 606—007 **27 Claims**



1. A medical device for applying heat to a selected site in a lumen, comprising:

an elongated, flexible member having a proximal end and a distal end;

a heating element attached to the distal end of said flexible member, said heating element comprising optical filter means for absorbing a first range of wavelengths and for passing a second range of wavelengths; and

optical fiber means for transmitting both said first and said second ranges of wavelengths extending through said flexible member, said optical fiber means having a distal end optically coupled to said heating element and having a proximal end adapted for receiving laser energy in said first range of wavelengths for heating said optical filter means and adapted for receiving laser energy in said second range of wavelengths for irradiating said lumen through said optical filter means.

5,009,656

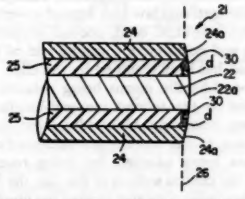
BIPOLAR ELECTROSURGICAL INSTRUMENT

Harry G. Reimels, Braintree, Mass., assignor to Mentor O&O Inc., Norwell, Mass.

Filed Aug. 17, 1989, Ser. No. 395,264

Int. Cl.[5] A61B *17/39*

U.S. Cl. 606—48 **30 Claims**



1. A surgical instrument of the kind which is adapted to operate using bipolar energizing potential comprising

a probe having a smooth operation tip, said probe including a pair of adjacently disposed, elongated electrodes adapted to receive said bipolar energizing potential, an electrically insulating means for spacing apart and generally separating said electrodes, each said electrode also

terminating at a distal end at said tip of said probe, said distal ends being generally in the same plane so that they form part of a smooth surface of said tip and so that neither distal end projects above or from said tip,

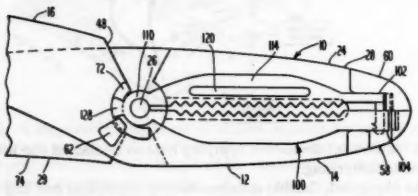
said electrically insulating means terminating proximally of said tip of said probe and of said distal ends of said electrodes to provide a cavity between said distal ends of said electrodes across which, when said instrument is in use, sparking between said distal ends of said electrodes occurs.

5,009,657

UMBILICAL CORD CUTTING AND CLAMPING DEVICE

John Cotey, Haddonfield, N.J., and Mohammed S. Jahanger, 500 Egg Harbor Rd., Turnersville, N.J. 08012, assignors to Mohammed S. Jahanger, Turnersville, N.J.

Filed Dec. 14, 1989, Ser. No. 450,743
Int. Cl.[5] A61B *17/32*
U.S. Cl. 606—120 4 Claims



1. In combination, an umbilical cord cutting and clamping device for severing an umbilical cord to form a maternal cord end and fetal cord end, and for clamping the fetal cord end, and a fetal cord end clip which is detachable from the device;

the clip comprising: a pair of elongated arms extending radially from a central section having an opening formed therein, each arm having teeth formed thereon and lock means formed proximate the end thereof for locking together the arms when the clip is closed, at least one arm having an elongated aperture formed therein for cushioning the force exerted on an umbilical cord when the clip is closed on the cord end, the central section including a clip positioning means for retaining the clip in the device until the cord end has been clamped;

the device comprising:

an integral first jaw-and-handle means, the first jaw-and-handle means including a first clamping means for clamping the maternal cord end, first severing means for severing the umbilical cord, and first support means for supporting and positioning a first end of the clip until the cord end has been clamped by the clip, and a rear retention means for supporting and positioning the central section of the clip until the cord end has been clamped by the clip, and

an integral second jaw-and-handle means, the second jaw-and-handle means including a second clamping means for clamping the maternal jaw end, second severing means for severing the umbilical cord, second support means for supporting and positioning a second end of the clip until the cord end has been clamped by the clip;

the first jaw-and-handle means being rotatably affixed by pivot means to the second jaw-and-handle means, the pivot means extending outwardly from and generally perpendicular to the second jaw-and-handle means, the pivot means being adapted for being received by the opening of the central section of the clip, the first jaw-and-handle means being rotatable around the pivot means from an open position to a closed position;

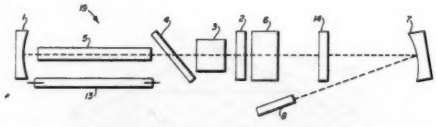
the rear retention means of the device retaining the clip positioning means of the clip to retain the central section of the clip in the device when the clip is installed in the device and the device is in the open position, the clip positioning means rotating with respect to the rear retention means to release the clip from the device after the fetal cord end has been clamped and the clip arms have been locked.

5,009,658

DUAL FREQUENCY LASER LITHOTRIPTER

Karsten Damgaard-Iversen, Marietta, Ga.; Robert C. Morris, Morris County, N.J.; Timothy C. Chin, Hunterdon County, N.J., and Jerry W. Kuper, Somerset County, N.J., assignors to Karl Storz Endoscopy-America, Inc., Culver City, Calif. and Allied-Signal, Inc., Morris Township, Morris County, N.J.

Filed Apr. 14, 1989, Ser. No. 337,919
Int. Cl.[5] A61B *17/22*
U.S. Cl. 606—128 38 Claims



1. A laser lithotripter system comprising, in combination:

a source of pulsed coherent radiation having a wavelength in the range of from about 300 to about 450 nm, at an energy level of from about 2 to about 30 mJ;

a source of pulsed coherent radiation having a wavelength from about 600 to about 900 nm, at an energy level of from about 15 to about 100 mJ,

said pulses of coherent radiation achieving temporal overlap; an endoscopic delivery system; and

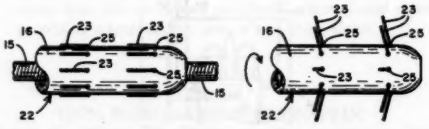
mirror means for focusing said temporally overlapping pulses of coherent radiation in spatially overlapped relationship into said endoscopic delivery system for delivery to calcified matter located within a mammalian body.

5,009,659

FIBER TIP ATHERECTOMY CATHETER

Robert N. Hamlin, Stillwater; Rick L. Shockey, Eagan, and Robert A. V. Tassel, Excelsior, all of Minn., assignors to Schneider (USA) Inc., Minneapolis, Minn.

Filed Oct. 30, 1989, Ser. No. 428,885
Int. Cl.[5] A61B *17/32*
U.S. Cl. 606—159 5 Claims



1. An atherectomy catheter for removing atheromas from a blood vessel wall comprising:

(a) an elongated flexible tubular shaft having a proximal end and a distal end, said shaft including a plurality of fibers of a predetermined length with only one end of each constrained by attachment to the outer surface of said shaft and normally extending parallel thereto proximate a portion of said distal end; and

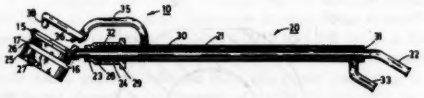
(b) means for rotating said shaft at a sufficiently high speed to cause said fibers to project radially outward of said shaft due to centrifugal force for flailing said atheroma and disintegrating same.

5,009,660

GAS PURGING, EYE FIXATION HAND PIECE

Terrance N. Clapham, Saratoga, Calif., assignor to VISX, Incorporated, Sunnyvale, Calif.

Filed Sep. 15, 1989, Ser. No. 407,566
Int. Cl.[5] A61F *9/00*
U.S. Cl. 606—166 25 Claims



1. In an eye fixation hand piece having a handle extending from a vacuum ring evacuated by a suction line and sized to encircle a cornea of an eye engaged by a proximal side of said vacuum ring so that by steadying the handle, a surgeon can hold the eye in a reference position for surgery, the improvement comprising:

a. a gas purging nozzle mounted on said hand piece and aimed for directing a purging gas jet into the space within said vacuum ring and toward said proximal side of said vacuum ring; and

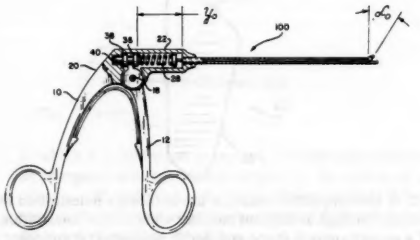
b. a line separate from said suction line arranged on said hand piece for delivering purging gas under pressure to said nozzle to form said purging gas jet.

5,009,661

PROTECTIVE MECHANISM FOR SURGICAL RONGEURS

Gary K. Michelson, 438 Sherman Canal, Venice, Calif. 90291

Filed Apr. 24, 1990, Ser. No. 341,849
Int. Cl.[5] A61B *17/16*
U.S. Cl. 606—170 12 Claims



1. A rongeur comprising a drive shaft having a cutting means proximate one end of said drive shaft, said cutting means responsive to movement of said drive shaft, said drive shaft movable responsive to a drive means for driving said drive shaft, a resilient member, said resilient member interposed between said drive means and said cutting means whereby force applied to said resilient member is transmitted to said drive shaft.

5,009,662

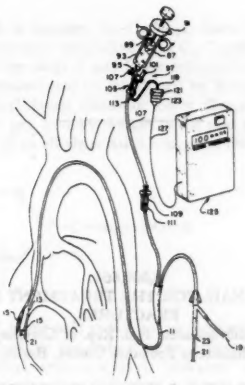
MEDICAL PRESSURE SENSING AND DISPLAY SYSTEM

William D. Wallace, 5038 Memory La., Salt Lake City, Utah 84117; Christopher A. Cutler, 130 N. 600 East, Centerville, Utah 84014, and Scott D. Gentry, 9067 S. Wagner Cir., Sandy, Utah 84093

Continuation-in-part of Ser. No. 230,783, Aug. 10, 1988. This application Mar. 23, 1989, Ser. No. 328,119
Int. Cl.[5] A61M *29/02*
U.S. Cl. 606—192 2 Claims

1. A system for measuring fluid pressure in a balloon of a catheter, said balloon being adapted for inflation inside a human body, said catheter having an inflation lumen providing a fluid path between the interior of the balloon and an external source of fluid for inflating the balloon, the improvement comprising:

a pressure transducer means in fluid communication with the interior of the balloon for providing an electrical signal output which is a function of the pressure in the interior of the balloon, a blood pressure readout transducer the output of said pressure transducer means being communicated with said blood pressure readout transducer generally used for monitoring a person's blood pressure; and



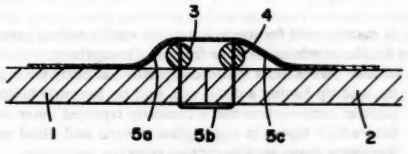
electronic digital display means calibrated to indicate blood pressure in mm Hg operatively associated with said blood pressure readout transducer and responsive to said electrical signal output from said pressure transducer for displaying a numerical value of said balloon pressure measured by said pressure transducer, which numerical value will correspond to the balloon pressure in psi units.

5,009,663

METHOD FOR PERFORMING A SURGICAL CLOSURE OF A SKIN INCISION OR WOUND AND MEANS FOR CARRYING OUT THE METHOD

Albert Broomé, Helsingborg, Sweden, assignor to Brava Patient Och Invent AB, Trollhattan, Sweden

Filed Mar. 22, 1990, Ser. No. 497,418
Int. Cl.[5] A61B *17/00*
U.S. Cl. 606—232 10 Claims



1. A method for performing a surgical closure of a open skin incision or wound presenting two opposite skin edge portions to be held together, comprising the steps of

sewing at least one suture thread through each one of said two skin edge portions and through each one of two separate elastic members associated with a respective one of said skin edge portions and arranged at the outside thereof, said elastic members being made of such a material that, when said suture thread is sewn therethrough frictional forces are established between said members and said suture thread, bringing together said two skin edge

portions using said suture thread, so that frictional forces alone prevent movement of the thread within the members without the need to knot the thread, said elastic members being positioned in such a relation to said suture thread that after completion of said closure, each of said elastic members is being held in contact against the respective skin edge portion by a tensioned portion of said suture thread and said skin edge portions are being held together by said tensioned portion of said suture thread.

5,009,664

MARROW NAIL FOR THE TREATMENT OF BONE FRACTURES

Uve Sievers, Ludwigshafen, Fed. Rep. of Germany, assignor to Mecron Medizinische Produkte GmbH, Berlin, Fed. Rep. of Germany

Filed Oct. 6, 1988, Ser. No. 254,086

Claims priority, application Fed. Rep. of Germany, Oct. 6, 1987, 3734108

Int. Cl.[5] A61F *2/28, 5/04*

U.S. Cl. 623—16 12 Claims

1. A marrow nail for use in a marrow cavity nailing procedure for the treatment of bone fractures, comprising:

a tubular, carbon fiber reinforced plastic nail body having a tip, said tip having a distal end, said tip having a hollow circular cross-section and a conically taperred outer surface which tapers in a direction toward said distal end forming a sharp annular cutting edge.

5,009,665

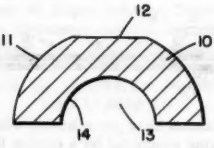
ACETABULAR CUP

Jon C. Serbousek, and John A. Engelhardt, both of Warsaw, Ind., assignors to Boehringer Mannheim Corp., Indianapolis, Ind.

Filed Feb. 8, 1989, Ser. No. 308,112

Int. Cl.[5] A61F *2/34*

U.S. Cl. 623—22 16 Claims



1. An improved acetabular cup prosthesis for use in cement fixation to bone, said cup comprising a hemispherical member having an internal recess which forms a bearing surface suitable for receiving a natural or prosthetic femoral head and a geperally hemispherical outer surface on which there is at least one substantially flat area displaced from the apex of the cup and within the cross-sectional profile of the hemispherical surface.

5,009,666

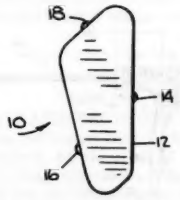
PLUG AND METHOD OF USE

Peter B. Van Syckle, and Glen A. Kashuba, both of Pfizer Inc., 235 E. 42nd St., New York, N.Y. 10017-5755

Continuation of Ser. No. 252,231, Sep. 30, 1988, abandoned. This application Dec. 21, 1989, Ser. No. 462,302

Int. Cl.[5] A61F *2/32, 2/28, 5/04*

U.S. Cl. 623—23 6 Claims



1. A biocompatible insert for use in filling a fenestration that extends through an implant member wherein the fenestration is of a predetermined shape and depth, said insert comprising at least two discs made of a relatively flexible material, each of said discs having a predetermined thickness and an outer perimeter defining a shape substantially identical to the predetermined shape of said fenestration, each of said discs having a plurality of ribs integrally formed about said outer perimeter thereof and interlocking means for interlocking said discs together to form said insert so that when said insert is press-fitted within said fenestration, the combined thickness of the discs is substantially equal to said predetermined depth of the fenestration in said implant, thereby completely filling the fenestration.

5,009,667

COMPOSITION AND METHOD FOR PROVIDING STAIN RESISTANCE TO POLYAMIDE FIBERS USING CARBONATED SOLUTIONS

Boyd R. Beck, Spring City, Utah, and Robert D. Harris, Cameron Park, Calif., assignors to Harris Research Inc., Cameron Park, Calif.

Filed Jan. 31, 1989, Ser. No. 304,727
Int. Cl.[5] D06M *11/00*
U.S. Cl. 8—115.56 32 Claims

1. An aqueous carbonated composition for treating polyamide fibers to impart stain resistance to said fibers consisting essentially of (a) between about 0.0015 to 1.5% w. of a dye-resist agent consisting of a condensation product of formaldehyde and a member selected from the group consisting of a sulfonated phenol or a sulfonated naphthol; (b) 0 to 6.0% w. of a fluorochemical; and (c) 0 to 5% w. of a detergent suitable for cleaning polyamide fibers with the remainder being made up of an inert aqueous carrier; said aqueous composition being maintained at a pH of between about 2.5 and 7.0 be means of said carbonation.

5,009,668

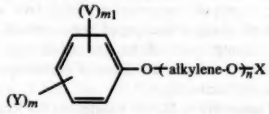
MIXTURE OF ASSISTANTS AND ITS USE IN THE DYEING OF SYNTHETIC FIBRE MATERIALS: ACID ESTER OF OXYALKYLATED PHENDL, NONIONIC SURFACTANT AND DYE CARRIER

Hans-Ulrich Berendt, Allschwil, and Rosemarie Töpfl, Dornach, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Feb. 8, 1990, Ser. No. 476,997
Claims priority, application Switzerland, Feb. 8, 1989, 430/89
Int. Cl.[5] D06P *1/61, 3/54*
U.S. Cl. 8—557 19 Claims

1. A mixture of dyeing assistants which comprises

(A) an acid ester, or salts thereof, of an alkylene oxide adduct of the formula



(1)

in which V is hydrogen or methyl, X is the acid radical of an inorganic acid containing oxygen, or the radical of an organic acid and Y is C_1–C_{12}alkyl, aryl or aralkyl, "alkylene" is the ethylene or propylene radical and m is 1 to 3, m_1 is 1 or 2 and n is 4 to 50,

(B) a nonionic surfactant containing polyglycol ether groups, and

(C) an aliphatic or aromatic carboxylic acid ester, an alkylbenzene, tetralin or a mixture of these substances;

with the proviso that the mixture is substantially free of non-aromatic, water-immiscible solvents.

5,009,669

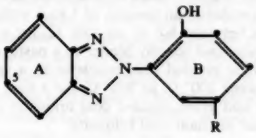
AQUEOUS DISPENSIONS OF 2-(2'-HYDROXYPHENYL)BENZOTRIAZOLES

Martin Jöllenbeck, Freiburg, Fed. Rep. of Germany; Hans-Ulrich Berendt, Allschwil, and Werner Fringeli, Laufen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed May 30, 1989, Ser. No. 358,910
Claims priority, application Switzerland, May 31, 1988, 2056/88; Aug. 5, 1988, 2981/88
Int. Cl.[5] C09B *67/00, 67/46*
U.S. Cl. 8—573 25 Claims

1. An aqueous dispersion of a 2-(2'-hydroxyphenyl)benzotriazole compound, comprising

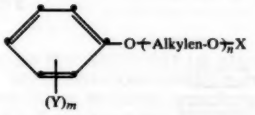
(a) 15 to 50 per cent by weight of a benzotriazole compound of the formula



(1)

where R is halogen, C_1–C_{12}alkyl, lower alkoxy, lower alkoxycarbonyl, cycloalkyl, aryl, C_1–C_{12}alkylaryl or aralkyl, and the rings A and B are independently of one another unsubstituted or substituted by halogen, hydroxyl, lower alkyl, lower alkoxy or lower alkoxycarbonyl, and

(b) 2 to 20 per cent by weight of an acid ester, or a salt thereof, of an alkylene oxide adduct of the formula



(2)

where X is the acid radical of an inorganic oxygen-containing acid, or the radical of an organic acid and Y is C_1–C_{12}alkyl, aryl or aralkyl, "Alkylen" is the ethylene radical or propylene radical, m is from 1 to 4 and n from 4 to 50.

5,009,670

FUELS FOR GASOLINE ENGINES

Franz-Dieter Martischius, Neustadt; Hans-Henning Vogel, Frankenthal; Norbert Greif, Bobenheim; Knut Oppenlaender, Ludwigshafen; Walter Denzinger, Speyer, and Heinrich Hartmann, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed May 16, 1989, Ser. No. 352,418
Claims priority, application Fed. Rep. of Germany, May 19, 1988, 3817000
Int. Cl.[5] C10L *1/14*
U.S. Cl. 44—385 3 Claims

1. A fuel for gasoline engines, containing small amounts of copolymers of alkyl (meth)acrylates where the alkyl radical is of 8 to 40 carbon atoms and/or vinyl esters of carboxylic acids of 8 to 40 carbon atoms and monoethylenically unsaturated mono- and/or dicarboxylic acids of 3 to 12 carbon atoms, having a total molecular weight of from 500 to 20,000 g per mole, some or all of the carboxyl groups of the copolymers having been reacted with an alkali with formation of the alkali metal salts and the remainder of the carboxyl groups having been reacted with ammonia and/or amines of not more than 50 carbon atoms to give the corresponding amide groups and/or ammonium salts, with the proviso that the fuel contains from 10 to 2,000 ppm by weight of the alkali metal salts of the copolymers.

5,009,671

PROCESS FOR PRODUCING A SOLID, FINELY DIVIDED FUEL BASED ON COAL

Friedrich H. Franke, Rieperting 3, 8201 Schonstett, and Michael J. Paersch, Rönkrei 6, 2000 Hamburg 65, both of Fed. Rep. of Germany

Filed Jun. 9, 1989, Ser. No. 364,358
Claims priority, application Fed. Rep. of Germany, Jun. 29, 1988, 3821950
Int. Cl.[5] C10L *5/14, 5/28*
U.S. Cl. 44—598 6 Claims

1. A process for producing a substantially water resistant coal briquettes comprising:

(a) heating a green molded coal briquette comprising a mixture of finely divided coal, a first binder containing starch in an amount of 0.5 to 3 wt% and a second binder comprising molasses and water in an amount of 1 to 4 wt% to a first temperature between 80° C. to 150° C. for a time sufficient to convert said starchy binder to a paste, and

(b) heating said green molded coal briquette to a second temperature between 200° C. to 300° C. for a time sufficient to convert said green molded coal briquette into a substantially water resistant coal briquette.

5,009,672

PROCESS FOR RECYCLING AND REUTILIZING WASTE, IN PARTICULAR SOLID URBAN WASTE

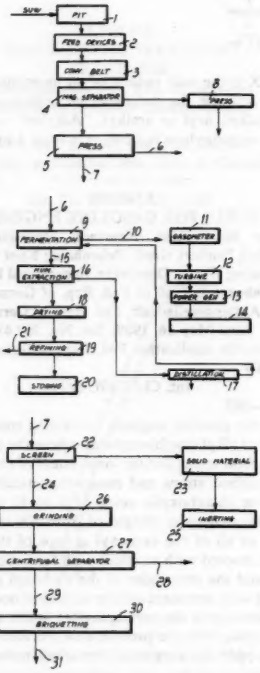
Giorgio Ruffo, Milan, and Luciano Vezzani, Ovada, both of Italy, assignors to Vezzani S.p.A., Ovada, Italy

Filed Sep. 13, 1989, Ser. No. 406,645

Claims priority, application Italy, Sep. 15, 1988, 21956 A/88

Int. Cl.[5] C10L 5/06

U.S. Cl. 44—593 **8 Claims**



8. Process for the recycling and complete recovery of solid urban waste and similar waste, comprising the steps of:

subjecting the solid urban waste (SUW) to high-pressure compression so as to separate putrescible organic material in a finely divided form from dry material of the solid urban waste,

subjecting said organic material to a process of anaerobic fermentation in a sealed reactor in order to extract biogas and obtain soft humus thus produced by the fermentation,

subjecting the humus obtained from the fermentation process to a refining and a screening process to recover light materials therefrom, said light materials subsequently being combined with said dry material obtained in said high-pressure compression step,

subjecting said dry material with said light materials to a screening process to separate combustible material, such as paper, fabrics, wood, plastics, leather, and rubber, from inert material, such as glass, powders, and non-ferrous metals, and

subjecting the combustible material to a grinding process and subsequently to a selection process by means of a separator for separating heavy parts, such as chlorinated heavy plastics, rubber, leather, and aluminum, from light parts, such as plastics in film, paper, and textiles,

subjecting said light parts obtained from said screening process to a briquetting operation to obtain a solid fuel.

5,009,673

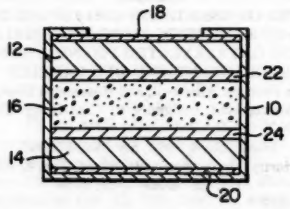
METHOD FOR MAKING POLYCRYSTALLINE SANDWICH COMPACTS

Hyun S. Cho, Sandy, Utah, assignor to The General Electric Company, Worthington, Ohio

Filed Nov. 30, 1988, Ser. No. 277,875

Int. Cl.[5] B24D 18/00

U.S. Cl. 51—293 **13 Claims**



1. A method for manufacturing a polycrystalline sandwich compact comprising a polycrystalline diamond or CBN core interposed between outer support layers, which comprises:

(a) providing an assembly comprising a mass of diamond or CBN particles; a pair of compression disks; two metal layers, one each of which is interposed between said mass and each of said compression disks; and when said mass comprises diamond particles, a source of sintering aid/-catalyst for diamond sintering;

(b) subjecting said assembly to HP/HT sintering for forming a sintered polycrystalline diamond or CBN core having two metal-derived support layers adherently bound thereto.

5,009,674

ABRASIVES

Reiner Kunz, Konigsbergerstrasse 33, D-7890 Waldshut-Tiengen; Albert Babl, Lindenstrasse 4, D-7891 Dogern; Ales Zahradnicek, Sonnhalde 33, D-7892 Albbruck, all of Fed. Rep. of Germany, and Rainer Dietrich, Thiersteinerrain 65, CH-4059 Basel, Switzerland

Continuation of Ser. No. 215,542, Jul. 6, 1988, abandoned. This application Nov. 2, 1989, Ser. No. 430,298

Claims priority, application Switzerland, Jul. 24, 1987, 2830/87; Aug. 31, 1987, 3334/87

Int. Cl.[5] B24B 1/00

U.S. Cl. 51—295 **5 Claims**

1. Abrasive grain having an aluminum oxide base, comprising the aluminum oxide base with a hygroscopic salt coated on its surface, the amount of said hygroscopic salt being 0.001 to 5.0 percent by weight relative to the amount of the abrasive grain, the specific resistance of the treated abrasive grain, measured in grain beds, being smaller than 3.5×10^{10} ohms×cm, and the hygroscopic salt is a carbonate, hydrogen carbonate, sulfate, nitrate, phosphate, fluoride or chloride of a metal of the first, second or third main group or of the first or second series of the transition metals of the periodic table.

5,009,675

COATED SILICON CARBIDE ABRASIVE GRAIN

Reiner Kunz, Waldshut-Tiengen, Fed. Rep. of Germany, and Rainer Dietrich, Basel, Switzerland, assignors to Lonza LTD, Switzerland

Filed Jun. 8, 1989, Ser. No. 363,059

Claims priority, application Switzerland, Jun. 17, 1988, 2356/88

Int. Cl.[5] B24B *1/00*

U.S. Cl. 51—295 **16 Claims**

1. Abrasive grain comprising at least one silicon carbide particle and a binder-free unmelted coating of 0.01 to 5 percent, relative to the weight of the abrasive grain, of highly dispersed hydrophilic metal oxide particles having a particle size of primary particles of about 1–500 nm in the d_{50} value and a specific surface of 5–500 m^2/g according to BET from the group of silicon dioxide, aluminum oxide, titanium dioxide and mixtures thereof, on the at least one silicon carbide particle.

5,009,676

SINTERED SOL GEL ALUMINA ABRASIVE FILAMENTS

Charles V. Rue, Petersham, Mass.; Ronald H. van de Merwe, Niagara Falls, Canada; Ralph Bauer, Niagara Falls, Canada; Scott W. Pellow, Niagara Falls, Canada; Thomas E. Cottringer, Niagara Falls, Canada, and Richard J. Klok, Niagara Falls, Canada, assignors to Norton Company, Worchester, Mass.

Filed Apr. 28, 1989, Ser. No. 345,139

Int. Cl.[5] C09C *1/68*

U.S. Cl. 51—309 **14 Claims**

1. A sintered sol gel filament shaped alumina based abrasive comprised of sintered alpha alumina crystals, said filament shaped alumina based abrasive having an average aspect ratio of at least ob 1 and a hardness of at least 16 GPa, said alpha alumina crystals having a size no greater than 1 micron.

5,009,677

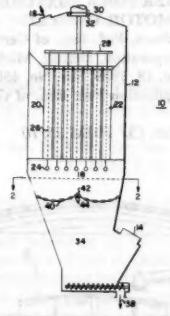
PROCESS FOR SEPARATING PARTICULATES IN AN ELECTROSTATIC PRECIPITATOR

Steven D. Wolf, Pocatello, Id.; James L. Manganaro, Princeton, N.J., and Ronald H. Miller, Pocatello, Id., assignors to FMC Corporation, Philadelphia, Pa.

Division of Ser. No. 401,904, Sep. 1, 1989, Pat. No. 4,968,330. This application Jul. 2, 1990, Ser. No. 546,958

Int. Cl.[5] B03C *3/00*

U.S. Cl. 55—12 **2 Claims**



1. A process for cleaning particle-laden gas flowing through an electrostatic precipitator zone comprising:

(a) passing a particle-laden gas into the inlet of an electrostatic precipitator zone having a gas inlet and gas outlet,

(b) passing said gas upwardly through a low pressure drop gas distributor in the form of a nonfouling chain screen wherein individual movable chain segments whose ends are affixed to support members make up said chain screen, and more evenly distributing said gas flow throughout said electrostatic precipitator zone,

(c) passing said gas into a plurality of collector electrode zones made up of substantially vertical hollow members suspended within said electrostatic precipitator zone,

(d) passing said gas through said collector electrode zones in proximity to a plurality of discharge electrode wires suspended within said collector electrode zones,

(e) ionizing said dust particles in said gas by means of said discharge electrode wires,

(f) collecting ionized dust particles on the inside surfaces of said collector electrode zones,

(g) removing collected dust particles from the inside surfaces of said collector electrode zones and dropping them onto and passing them through the movable segments of said chain screen gas distributor concurrent to said upward flowing gas, and into a hopper zone, and

(h) removing gas, substantially reduced in dust, from said perpendicular zone through said gas outlet.

5,009,678

PROCESS FOR RECOVERY OF AMMONIA FROM AN AMMONIA-CONTAINING GAS MIXTURE

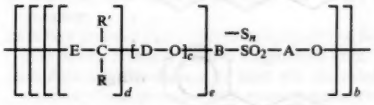
Benjamin Bikson, Brookline; Joyce K. Nelson, Lexington, and Jerry E. Perrin, Dorchester, all of Mass., assignors to Union Carbide Industrial Gases Technology Corporation, Danbury, Conn.

Filed Oct. 31, 1989, Ser. No. 429,817

Int. Cl.[5] B01D *53/22, 71/68*

U.S. Cl. 55—16 **24 Claims**

1. A process for separating ammonia from a gaseous mixture thereof with other gaseous components which comprises contacting said gaseous mixture with one side of a gas separation composite membrane comprising a porous support coated with a thin layer of a cation exchange type polymer containing the sulfonic acid ion exchange group in the polymer molecule represented by the general formula:



(I)

wherein A, B, D and E are unsubstituted or substituted arylene groups with at least one A, B, D, E groups in the polymer chain repeat unit substituted by a free sulfonic acid group or its salified form: R and R' can be the same or different and represent an alkyl group or a halogenated alkyl group having from 1 to 4 carbon atoms; b represents the polymer average molecular weight, generally above about 10,000; c, d and e are integers having a value of from zero to about 6; and the degree of sulfonation $-S_n$ is from about 0.2 to about 2; and recovering the permeate and retentate components, said polymer providing enhanced selectivity and permeability characteristics for the selective permeation and separation of ammonia as the permeate component from the other components of the gaseous mixture comprising retentate components.

5,009,679

MEMBRANES FORMED FROM RIGID AROMATIC POLYIMIDE POLYMERS

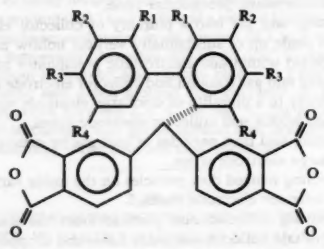
Richard O. Angus, and Kahlil Yacoub, both of Allentown, Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed May 25, 1990, Ser. No. 529,078

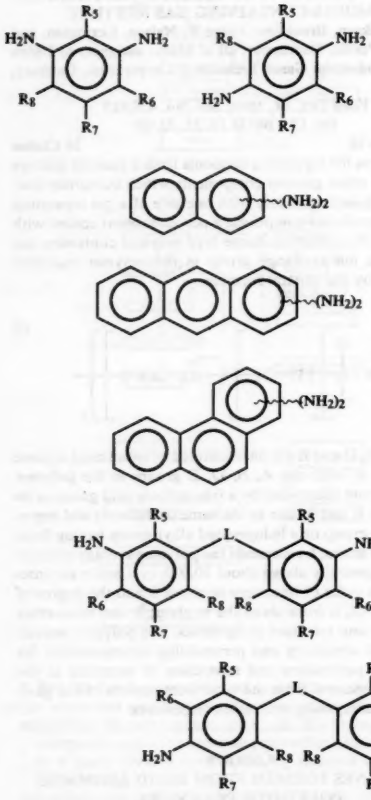
Int. Cl.[5] B01D *53/22, 71/64*

U.S. Cl. 55—16 **24 Claims**

1. A semi-permeable membrane formed from a polyimide obtained by the reaction of a 9,9-bis-(3,4-dicarboxyphenyl)-fluorene represented by the formula:



wherein R_1 through R_4, inclusive, are independently selected from a hydrogen atom, a linear or branched alkyl, alkenyl or alkoxy group having form 1 to about 8 carbon atoms, cyano or R_1 and $R_{1'}$, R_1 and R_2, R_2 and R_3, and R_3 and R_4 may together form part of cyclohydrocarbyl ring; and an aromatic diamine represented by the formulae:



wherein R_5 through R_8, inclusive, are independently selected from a hydrogen atom or a linear or branched alkyl, alkenyl or alkoxy group having from 1 to about 8 carbon atoms, each of which can optionally be partially or fully fluorinated; and

L is a linear or branched alkylene, alkenylene, phenylene or alkylphenylene group having from 1 to about 8 carbon atoms, each of which can optionally be partially or fully fluorinated.

16. A process for separating a component of a gas mixture containing at least one other component, said process comprising: bringing said gas mixture into contact with the membrane of claim 1 whereby one component selectively permeates through said membrane.

5,009,680

METHOD AND A SYSTEM FOR SEPARATING AND TRANSPORTING GAS AND LIQUID

Kristian Brekke, Oslo, Norway, assignor to Aker Engineering a.s., Oslo, Norway

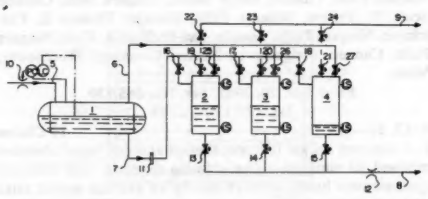
PCT No. PCT/NO89/00123, § 371 Date Jun. 11, 1990, § 102(e) Date Jun. 11, 1990, PCT Pub. No. WO90/06472, PCT Pub. Date Jun. 14, 1990

PCT Filed Nov. 28, 1989, Ser. No. 488,061

Claims priority, application Norway, Nov. 28, 1988, 885302; Mar. 17, 1989, 891194

Int. Cl.[5] B01D *19/00*

U.S. Cl. 55—40 **6 Claims**



1. A process for the transportation of gas and liquid or solid media and the separation of gas from liquid or solid media in a manner so that the pressure in the gas separated off in one separator stage is used for the transportation of separated fluids from a subsequent separator stage, comprises the steps of:

(a) separating gas off at high pressure in one separator stage or adding it from another gas source and

(b) directing said separated or added gas into a separator containing fluid from which gas has been separated at a lower pressure;

(c) said high pressure gas forcing out already separated fluid present in the separator receiving said high pressure gas.

5,009,681

AIR INLET CHAMBER FOR A MIXTURE FORMER OF A MOTOR VEHICLE

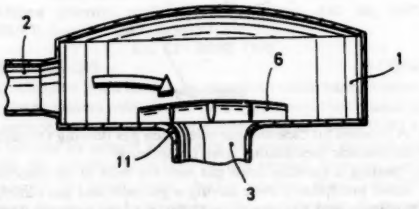
Gunter Jochum, Eschborn, Fed. Rep. of Germany, assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 18, 1989, Ser. No. 450,870

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1988, 3843019

Int. Cl.[5] F02M *35/10*

U.S. Cl. 55—416 **8 Claims**



1. An air inlet chamber for a mixture former of a fuel injection system of a motor vehicle, which comprises a lateral air inlet for connection to a hose coming from an air filter of the

vehicle and an axial air outlet for introducing the air into the mixture former, in which in the air inlet chamber on the air outlet is disposed a star-shaped insert which divides the air-flow into individual sectors, as a flow rectifier.

5,009,682

APPARATUS FOR DEGASSING FLUIDS

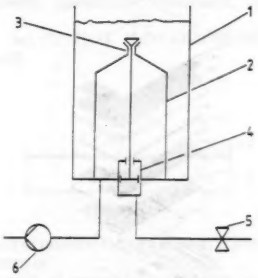
Ulrich Hagelauer, Bottighofen, Fed. Rep. of Germany, assignor to Storz Medical AG, Kreuzlingen, Switzerland

Filed Dec. 22, 1989, Ser. No. 454,857

Claims priority, application Fed. Rep. of Germany, Dec. 31, 1988, 3844460

Int. Cl.[5] B01D *19/00*

U.S. Cl. 55—159 **12 Claims**



1. An apparatus for degassing fluids comprising,

a pressure-resistant container for storing a fluid to be degassed;

a low pressure producing means for producing a low pressure in the pressure-resistant container for carrying out a degassing of fluids;

a supply vessel for supplying the fluid to be degassed to the pressure-resistant container, the supply vessel surrounding the pressure-resistant container;

a valve for connecting the pressure-resistant container to the supply vessel at a valve opening, the valve having open and closed positions; and

a piston/cylinder unit having a working piston for moving the valve between the opened and closed positions due to a pressure differential across the working piston resulting from the low pressure in the pressure-resistant container so that fluid to be degassed flows into the pressure-resistant container from the surrounding supply vessel and separated gas escapes through the valve opening.

5,009,683

PURIFYING AIR CONDITIONER

Shin-Ching Sun, 3F., No. 32, Lane 132, Hu-Lin St., Taipei, Taiwan

Filed Jul. 24, 1989, Ser. No. 383,481

Int. Cl.[5] B03C *3/00*

U.S. Cl. 55—131 **1 Claim**

1. An improved air conditioner for purifying air by removing dust particles therefrom, comprising: a negative ion-filtering device disposed behind an air blow direction regulating grill of a front upper face of said air conditioner, said negative ion-filtering device comprising high voltage leads connecting a PC board to high voltage electric sheets in order to cause production of negative ions and a positive charge providing dust collecting mesh disposed between said high voltage electric sheets to cause floating dust particles in air passing after temperature adjustment to carry negative charges so that negative charged floating dust particles are sucked in attachment to said positive charged dust mesh, charged and any dust particles passing said positive charged dust mesh are negatively charged and allowed to fall in attachment to positive ground charges as the air exits the air blow regulating grill.

5,009,684

MULTIPLE CYCLONE SEPARATOR

Ernst Johansson, 6, Björnåkersgatan, S-937 00 Burträsk, Sweden

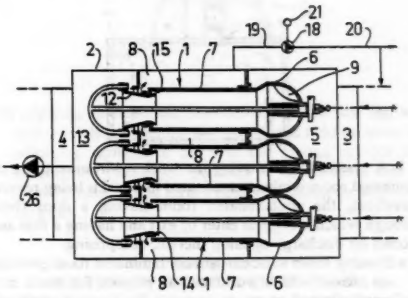
PCT No. PCT/SE87/00627, § 371 Date Jun. 26, 1989, § 102(e) Date Jun. 26, 1989, PCT Pub. No. WO88/04953, PCT Pub. Date Jul. 14, 1988

PCT Filed Dec. 22, 1987, Ser. No. 378,184

Claims priority, application Sweden, Dec. 22, 1986, 8605590

Int. Cl.[5] B01D *45/12*

U.S. Cl. 55—340 **7 Claims**



1. A purification unit for separating solid particles from a gas stream, comprising:

wall means defining a common chamber having an inlet for a gas stream to be purified, and an outlet for a purified gas stream;

wall means defining a common chamber having an inlet for a gas stream to be purified, and an outlet for a purified gas stream;

at least one flow cylinder unit disposed in said common chamber;

each flow cylinder unit comprising a plurality of flow cylinders having mutually parallel longitudinal axes;

each flow cylinder having an inlet end provided with a stationary head provided with opening means configured to accept a portion of the gas stream entering the common chamber through said inlet to said common chamber and set such portion into rotary motion relative to the longitudinal axis of the respective flow cylinder;

each flow cylinder further having an outlet end having a tubular outlet diffuser having an inlet end telescopically coaxially received therein with spacing therebetween defining an annular gap out through which solid particles separated from the gas stream portion in the respective said flow cylinder may flow into common chamber;

each said outlet diffuser further having an outlet end, out through which the respective gas stream portion, cleansed of said solid particles, flows out of the respective flow cylinder and out of said outlet of said common chamber;

said wall means defining said common chamber further including wall means isolating said inlet end of each flow cylinder and said outlet end of each flow cylinder, from said annular gap of each flow cylinder and thereby defining within said common chamber a closed dust collection chamber;

a steplessly adjustable blower having a suction side and a pressure side; and

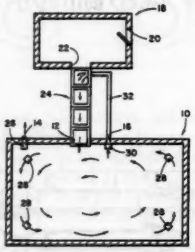
suction conduit means operatively connecting the suction side of said blower with said dust collection chamber for maintaining a negative pressure within said dust collection chamber for enhancing separation of said solid particles from said gas stream.

5,009,685

SYSTEM FOR IMPROVING THE WORK ENVIRONMENT IN A CONTAMINATED ROOM

Cary L. Wilson, 5408 E. 11th St., Ste. B, Tulsa, Okla. 74112, and John A. Graham, 4606 E. 67th St., Ste. 403-7, Tulsa, Okla. 74136

Filed Feb. 15, 1990, Ser. No. 480,275
Int. Cl.[5] B01D *46/42*
U.S. Cl. 55—385.2 5 Claims



1. A system for improving the work environment in a contaminated room while contaminated material is being removed therefrom, the contaminated room having a door therein through which workmen enter or exit and having a first and a second air discharge opening therein, comprising:

a dressing room adjacent said contaminated room providing an area in which workmen can prepare for work in the contaminated room or prepare for leaving work after working in the contaminated room, the dressing room having a door therein;

a decontamination unit connecting said dressing room door with said contaminated room door through which workmen pass when entering or exiting the contaminated room;

at least one filtered air pump means passing filtered air from within said contaminated room through said first air discharge opening to the exterior of said contaminated room to maintain negative air pressure within said contaminated room;

a conduit connecting said contaminated room second air discharge opening with said decontamination unit; and

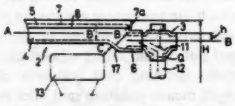
a filter air pump means for passing filtered air through said conduit into said decontamination unit to maintain positive air pressure within said decontamination unit whereby air flow is maintained from said decontamination unit into said contaminated room.

5,009,686

AIR CLEANER OF ENGINE FOR VEHICLE

Toshifumi Yuunaga, Wakabayashi, Japan, assignor to Suzuki Jidosha Kogyo Kabushiki Kaisha, Shizuoka, Japan

Filed May 22, 1989, Ser. No. 354,763
Claims priority, application Japan, May 24, 1988, 63-126797
Int. Cl.[5] B01D *46/00*
U.S. Cl. 55—419 1 Claim



1. An air cleaner of an engine of a vehicle, comprising:

an upper case;

a lower substantially cylindrical case fitted to said upper case;

an air valve; and

an air intake on said lower case having a cylindrical part extending horizontally and joining said air valve;

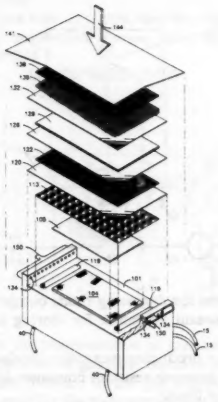
said air intake including an inclined portion, said inclined portion extending from the lower edge of said lower case and the upper edge of said lower case, so that a central point of an opening formed in said cylindrical part is positioned lower than a horizontal plane passing through the center of said lower case, the cross sectional area of said inclined portion being substantially the same as the cross sectional area of said cylindrical part adjacent said inclined portion to facilitate air flow through said air intake.

5,009,687

METHOD OF MOLDING A COMPOSITE ARTICLE USING SOFTENED GLASS AS A PRESSURE TRANSMITTING MEDIUM

Robert V. Kromrey, Campbell, Calif., assignor to United Technologies Corporation, Hartford, Conn.

Filed Oct. 2, 1989, Ser. No. 416,212
Int. Cl.[5] B29C *43/10*
U.S. Cl. 65—18.1 9 Claims



1. A method for molding a high temperature composite comprising:

(a) providing a compliant layer of softened material selected from the group consisting of glass, ceramic and mixtures thereof;

(b) applying heat to a composite precursor; and

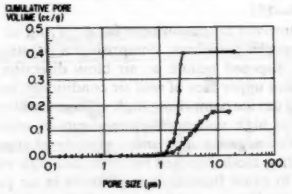
(c) causing said layer of softened material to apply pressure substantially uniformly to said composite precursor.

5,009,688

PROCESS FOR PRODUCING POROUS GLASS

Kazuki Nakanishi, Hirakata, Japan, assignor to Asahi Glass Company, Ltd., Tokyo and Naohiro Soga, Kobe, both of, Japan

Filed Sep. 18, 1989, Ser. No. 408,299
Claims priority, application Japan, Sep. 28, 1988, 63-245532; Mar. 8, 1989, 1-56886
Int. Cl.[5] C03B *19/09, 20/00*
U.S. Cl. 65—18.3 9 Claims



1. A process for producing porous glass, which comprises preparing a reaction solution containing a metal alkoxide or partially polymerized metal alkoxide and an organic polymer, hydrolyzing and polymerizing the metal alkoxide or partially polymerized metal alkoxide in said solution to obtain a gel, and calcining the gel to obtain porous glass, wherein said organic

polymer is uniformly soluble with the solution of the metal alkoxide or partially polymerized metal alkoxide, undergoes continuous interlocking phase separation during the hydrolysis-polymerizing step and is substantially free from formation of precipitates, wherein the organic polymer is selected from the group consisting of sodium polystyrene sulfonate, polyacrylic acid, polyallylamine, polyethylene-imine, polyethylene oxide and polyvinyl pyrrolidone.

5,009,689

METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE

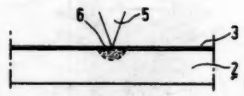
Jan Haisma; Cornelis L. Alting, and Theodorus M. Michielsen, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 27, 1987, Ser. No. 7,153

Claims priority, application Netherlands, Jan. 30, 1986, 8600216

Int. Cl.[5] H01L *21/00*; C03B *29/00*

U.S. Cl. 65—33 **8 Claims**



1. A method of manufacturing a semiconductor device comprising the steps of

providing each of a support body and a monocrystalline semiconductor body with an optically smooth surface by a step of bulk-reducing polishing, said monocrystalline semiconductor body consisting of a material having sufficient oxygen diffusion,

providing an oxide layer at the optically smooth surface of at least said semiconductor body,

subjecting at least said oxide layer to a bonding-activating operation,

then mechanically contacting said support body and said oxide layer on said semiconductor body at said optically smooth surface of each to provide a contact surface, said contacting step being carried out in a dust-free atmosphere, and said contacting step being carried out after cleaning said surface of each,

focussing laser radiation on at least a part of said contact surface through said support body, said support body being transparent to said laser radiation,

locally melting at least point portions, each portion being over a region of about 5 μm of said semiconductor body, at said contact surface by said laser radiation, and

forming locally fused connections between said support body and said semiconductor body by diffusing oxygen from said oxide layer into said semiconductor body and by then solidifying said melted portions.

5,009,690

METHOD OF BONDING SINGLE CRYSTAL QUARTZ BY FIELD-ASSISTED BONDING

Richard M. Curlee, Tijeras; Clinton D. Tuthill, Edgewood, and Randall D. Watkins, Albuquerque, all of N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 9, 1990, Ser. No. 490,895

Int. Cl.[5] C03C *27/00*

U.S. Cl. 65—40 **16 Claims**

1. A method of producing a hermetically stable structural bond between quartz crystals, comprising the steps of:

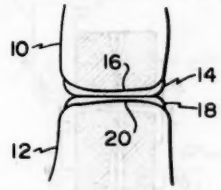
(a) providing first and second quartz crystals;

(b) depositing a thin film of borosilicate glass on a portion of said first crystal, the borosilicate glass film having a thickness in the range of about 3,000 to about 13,000 angstroms;

(c) depositing a thin film of silicon on a portion of said second crystal, the silicon film having a thickness in the range of about 3,000 to about 13,000 angstroms;

(d) juxtaposing said portions of said first and second crystals in a surface contact relationship to thereby provide surface contact between said thin films;

(e) heating said first and second crystals to a temperature for a period sufficient to cause said glass and silicon films on respective crystals to become electrically conductive; and



(f) applying an electrical potential across said first and second crystals for creating an electrostatic field between the adjoining surfaces of the first and second crystals and causing the juxtaposed portions to be attracted into an intimate contact and form a bond for joining the adjoining surfaces.

5,009,691

METHOD OF BENDING GLASS PLATE

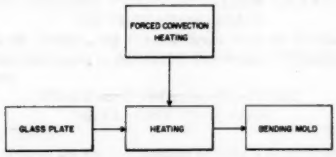
Shin-ichi Aratani, Taki, Japan, assignor to Central Glass Company, Limited, Ube, Japan

Filed Mar. 23, 1990, Ser. No. 497,853

Claims priority, application Japan, Mar. 24, 1989, 1-73339; Mar. 31, 1989, 1-80537

Int. Cl.[5] C03B *23/023*

U.S. Cl. 65—106 **13 Claims**



2. A method of bending a glass plate thinner than 6 mm into a predetermined shape having a radius of curvature not larger than 2000 mm, the method having the steps of heating the glass plate in its entirety of a temperature sufficient for bending and bringing the heated glass plate into engagement with at least one bending mold,

characterized in that during the heating step at least one end region of the glass plate is additionally heated by forced convection such that the heat transfer coefficient on at least one major surface of the glass plate in said at least one end region becomes greater than in the remaining region by an amount in the range from 5 to 50 $kcal/m^2 \cdot h \cdot °C$.

5,009,692

METHOD OF MAKING FIBER OPTIC COUPLER

William J. Miller, and Carlton M. Truesdale, both of Corning, N.Y., assignors to Corning Incorporated, Corning, N.Y.

Division of Ser. No. 223,423, Jul. 25, 1988, Pat. No. 4,902,324. This application Feb. 9, 1990, Ser. No. 477,494

Int. Cl.[5] C03C *25/02*

U.S. Cl. 65—3.11 **8 Claims**

1. A method of making a fiber coupler comprising the steps of

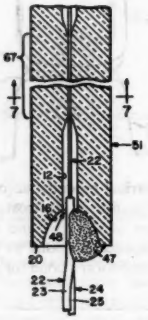
providing a glass tube having first and second opposite end

portions and a midregion, a longitudinal aperture extending from a first end of said tube to a second end thereof,

disposing at least two glass optical fibers, each having a core and cladding, within said longitudinal aperture, said at least two fibers extending beyond said first and second ends of said tube,

heating said midregion of said tube to collapse said midregion around said fibers,

drawing at least a portion of said midregion, the end portions



of said aperture remaining open, wherein said heating to collapse said midregion and said drawing position said fibers to provide optical coupling from one of said fibers to another of said fibers, thereafter,

heating said tube at the uncollapsed portions of said aperture, and

applying glue to the ends of said tube aperture so that said glue is drawn into said aperture and onto said fibers as said tube cools,

cooling said tube.

5,009,693

METHOD AND APPARATUS FOR BENDING GLASS

Kenneth Freidel, Cherry Hill; L. Arthur Littleton, Merchantville, and William G. Freund, Burlington, all of N.J., assignors to Muirfield Holdings L.P., Pennsauken, N.J.

Filed Oct. 4, 1989, Ser. No. 417,090

Int. Cl.[5] C03B *23/033*

U.S. Cl. 65—107 **16 Claims**

1. Apparatus for bending glass sheets, comprising

an oven for receiving a glass sheet and for heating the glass sheet to a hot, softened condition,

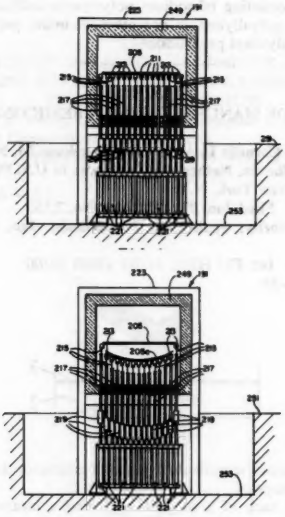
conveyor means in the oven for moving the glass sheet through the oven,

said conveyor means including longitudinal rows of oven mini-rollers for supporting glass sheets in the oven,

power means connected to the oven mini-rollers for rotating them,

support means in the oven for supporting each longitudinal row of mini-rollers,

means connected to each longitudinal row of oven mini-rollers for changing the vertical position of each longitudinal row of mini-rollers to a glass bending position where the vertical position of each longitudinal row of oven mini-rollers across the width of the oven forms the contour of a desired bend for bending the hot, softened glass sheet as



the hot, softened glass sheet conforms to the bend formed by the oven mini-rollers to form a bent glass sheet, and means for quenching the bent glass sheet.

5,009,694

METHOD FOR HEAT TREATMENT OF GLASS PLATE TO STRENGTHEN ITS PERIPHERAL REGION

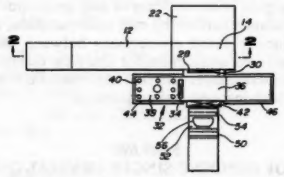
Masami Nishitani, Mie Pref., and Joji Suetomi, Matsusaka, both of Japan, assignors to Central Glass Company, Ltd., Ube, Japan

Filed May 24, 1990, Ser. No. 527,875

Claims priority, application Japan, May 31, 1989, 1-138074

Int. Cl.[5] C03B *25/00, 27/00*

U.S. Cl. 65—115 **15 Claims**



1. A heat treatment method for strengthening a glass plate in a peripheral region thereof, comprising the steps of:

(a) heating the glass plate to a first temperature in the range from 550° to 650° C.;

(b) placing the heated glass plate on a ring-like holder, which is maintained at a second temperature lower than said first temperature by 100° to 600° C., such that a peripheral region of the glass plate contiguous to the peripheral edge of the glass plate makes contact with an upper surface of the ring-like holder;

(c) keeping the ring-like holder together with the glass plate placed thereon in an annealing furnace maintained at a third temperature which is in the range from 50° to 500° C. and is not higher than said second temperature until the

temperature of the glass plate lowers nearly to said third temperature; and

(d) after step (c) allowing the glass plate to cool down to room temperature.

5,009,695

APPARATUS FOR PRODUCING TWO DIMENSIONALLY BENT GLASS

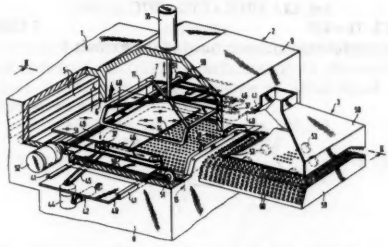
Hans-Werner Kuster, Aachen, Fed. Rep. of Germany, and Luc Vanaschen, Eupen, Belgium, assignors to Saint-Gobain Vitrage, Courbevoie, France

Filed Jun. 6, 1989, Ser. No. 362,346

Claims priority, application Fed. Rep. of Germany, Jun. 8, 1988, 3819503

Int. Cl.[5] C03B *23/03*

U.S. Cl. 65—182.2 **14 Claims**



1. An apparatus for producing two-dimensionally bent glass plates, comprising:

a roller oven having horizontally extending conveying rollers, for heating a horizontally positioned glass sheet to a bending temperature;

a pressing and bending unit positioned downstream of said roller oven in a glass sheet conveying direction, comprising:

(a) a lower full surface male bending mold having a perforate top surface lying in a plane defined by said conveying rollers,

(b) means for supplying pressurized hot gasses to the perforations of said lower bending mold, whereby a hot gas cushion may be formed between said lower bending mold and a glass sheet in said pressing and bending unit,

(c) a female mold positioned over said lower bending mold, and

(d) means for vertically moving said female mold towards said lower bending mold for pressing and bending a glass sheet resting thereon; a cooling device positioned downstream from said

pressing and bending unit for cooling a bent glass sheet; and

means for conveying a glass sheet from said roller oven to said pressing and bending unit and means for transferring a bent glass sheet from said pressing and bending unit to said cooling device.

5,009,696

FERTILIZER WITH A DEGRADATIVE COATING

Toshio Fujita; Yoshisato Yamashita; Shigemitsu Yoshida, and Katsutoshi Yamahira, all of Minamatashi, Japan, assignors to Chisso Corporation, Osaka, Japan

Continuation of Ser. No. 64,577, Jun. 22, 1987, abandoned. This application Dec. 16, 1988, Ser. No. 285,617

Claims priority, application Japan, Jul. 7, 1986, 61-159149; Aug. 7, 1986, 61-160126

Int. Cl.[5] C05G *3/00, 3/10*

U.S. Cl. 71—64.07 **20 Claims**

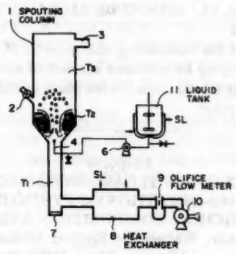
1. A granular chemical fertilizer with a degradative coating comprising as its combination of active ingredients

(a) a polyolefin resin and

(b) an ethylene-vinyl acetate-carbon monoxide copolymer, said polyolefin resin being selected from the group consisting of:

(1) polyethylene,

(2) polypropylene,



(3) polybutene-1, and

(4) copolymers of at least two members selected from the group consisting of ethylene, propylene and butene-1,

the ratio by weight of said ethylene-vinyl acetate-carbon monoxide copolymer to said polyolefin resin being in the range of 0.1 to 1.8.

5,009,697

LIQUID ORGANIC PEAT FERTILIZER AND PROCESS OF PREPARING SAME

Antonio M. Martin, and Peter J. Scott, both of Newfoundland, Canada, assignors to Memorial University of Newfoundland, Canada

Filed Dec. 1, 1987, Ser. No. 127,161

Int. Cl.[5] C05F *11/02, 11/04*

U.S. Cl. 71—24 **21 Claims**

1. A process for the preparation of both a liquid peat extract substantially-free from biologically-undesirable concentrations of metal elements and compounds, and a solid peat residue substantially-free from biologically-undesirable concentration of metal elements and compounds, which process comprises:

subjecting particles of high-moor, low-decomposed sphagnum-type peat which has a lower proportion of humic acids, a higher concentration of hydrolyzable nitrogen compounds, and a higher proportion of weakly-bound biologically-active substances than low-moor peat, more than about 50% of said particles having a diameter of about 250 μm or less, to a relatively mild acid hydrolyzation reaction under sterile controlled conditions at superatmospheric pressure at a temperature above the boiling point of water to a maximum elevated temperature of about 130° C. for a time of from about 1 to about 2 hours in an inert container, to provide a reacted medium comprising an aqueous liquid peat extract phase and a solid hydrolyzed peat phase dispersed therethrough;

adjusting the pH of the reaction medium to about neutral;

removing said neutralized reaction medium from said inert container;

pressing and filtering said removed, neutralized reacted medium in inert equipment; and

recovering both said liquid peat extract, and said solid hydrolyzed peat residue.

5,009,698

METHOD FOR STIMULATING PLANT GROWTH USING SYNTHETICALLY PRODUCED 9-BETA-1(+) ADENOSINE

Stanley K. Ries; Violet F. Wert, and Muraleedharan G. Nair, all of East Lansing, Mich., assignors to Board of Trustees operating Michigan State University, East Lansing, Mich.

Filed Apr. 28, 1989, Ser. No. 345,217
Int. Cl.[5] A01N *43/08, 43/713, 43/90*
U.S. Cl. 71—92 **7 Claims**

1. A method for stimulating the growth of a plant which comprises: applying an effective amount of synthetically prepared 9-beta-L,(+) adenosine to the plant in order to stimulate growth of the plant.

5,009,699

1-{[O-(CYCLOPROPYLCARBONYL)PHENYL]SULFAMOYL}-3-(4,6-DIMETHOXY-2-PYRIMIDINYL)UREA HERBICIDAL COMPOSITION AND USE

Thomas E. Brady, Whitehouse Station; Michael E. Condon, Lawrenceville, and Pierre A. Marc, Willingboro, all of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jun. 22, 1990, Ser. No. 542,564
Int. Cl.[5] A01N *43/54;* C07D *239/69*
U.S. Cl. 71—92 **8 Claims**

1. 1-{[O-(cyclopropylcarbonyl)phenyl]sulfamoyl}-3-(4,6-dimethoxy-2-pyrimidinyl)urea.

5,009,700

USE OF PYRITHIONE FOR THE CONTROL OF MOSS

Eugene F. Rothgery, North Branford, Conn., assignor to Olin Corporation, Cheshire, Conn.

Filed Jul. 26, 1990, Ser. No. 558,279
Int. Cl.[5] A01N *43/40, 55/02, 31/08*
U.S. Cl. 71—94 **5 Claims**

1. A process for ridding moss from an unwanted location which comprises contacting the moss with a mossicidal effective amount of sodium pyrithione, zinc pyrithione, or a combination thereof.

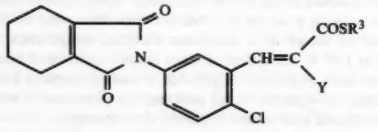
5,009,701

5-(N-3,4,5,6-TETRAHYDROPHTHALIMIDO)CINNAMIC ACID DERIVATIVES

Peter Plath, Frankenthal; Karl Eicken, Wachenheim; Lothar Rueb, Speyer; Barbara Schwalge, Ludwigshafen; Karl-Otto Westphalen, Speyer, and Bruno Wuerzer, Otterstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Sep. 6, 1989, Ser. No. 403,382
Claims priority, application Fed. Rep. of Germany, Sep. 9, 1988, 3830733
Int. Cl.[5] A01N *43/38;* C07D *209/48*
U.S. Cl. 71—96 **12 Claims**

1. A 5-(N-3,4,5,6-tetrahydrophthalimido)cinnamic acid compound of the formula Ib



Ib

where the substituents have the following meanings:

Y is chlorine, bromine or C_1–C_4-alkyl, and

R^3 is C_1–C_6-alkyl, or C_2–C_6-alkyl mono- to tri-substituted by C_1–C_4-alkoxy, C_1–C_4-alkylthio and/or hydroxyl.

2. A herbicidal composition which comprises: an effective amount of a 5-(N-3,4,5,6-tetrahydrophthalimido)-cinnamic acid compound of the formula Ib as set forth in claim 1, and herbicidally acceptable carrier.

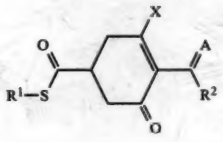
5,009,702

CYCLOHEXENONE COMPOUNDS AND USE AS HERBICIDES OR AS PLANT GROWTH REGULATORS

Michael Keil, Freinsheim; Ulrich Schirmer, Heidelberg; Juergen Kast, Boehl-Iggelheim; Dieter Kolassa, Ludwigshafen; Bruno Wuerzer, Otterstadt; Norbert Meyer, Ladenburg; Wilhelm Rademacher; Johann Jung, both of Limburgerhof, all of Fed. Rep. of Germany, and Dale R. Carlson, Durham, N.C., assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 240,465, Sep. 2, 1988, abandoned, which is a continuation-in-part of Ser. No. 201,891, Jun. 3, 1988, abandoned. This application Mar. 22, 1989, Ser. No. 327,352
Int. Cl.[5] A01N *37/00;* C07C *327/00*
U.S. Cl. 71—100 **5 Claims**

1. A cyclohexenone compound of the formula I



(I)

where

R^1 is hydrogen; C_1–C_6-alkyl which is unsubstitued or substituted by C_1–C_4-alkoxy, C_1–C_4-alkylthio, C_1–C_4-dialkylamino, hydroxyl or halogen; C_1–C_6-alkenyl; C_3–C_6-cycloalkyl; or phenyl or benzyl which is unsubstituted or substituted by halogen, C_1–C_4-alkyl, C_1–C_4-alkoxy or nitro,

R^2 is C_1–C_4-alkyl or cyclopropyl,

A is oxygen; a radical NOR^3, where R^3 is C_1–C_4-alkyl, C_3- or C_4-alkenyl, C_3- or C_4-alkynyl, C_2–C_4-haloalkyl, C_3- or C_4-haloalkenyl or C_2–C_4-alkoxyalkyl; or a radical NR^4, where R^4 is hydrogen, C_1–C_6-alkyl, C_1–C_4-hydroxyalkyl, C_1–C_4-alkoxyalkyl, benzyl or phenyl, and X is hydroxyl; chlorine; C_1–C_6-alkylthio which is unsubstituted or substituted by C_1–C_4-alkoxy, C_1–C_4-alkylthio, C_1–C_4-dialkylamino, hydroxyl or halogen; C_1–C_6-alkenylthio; C_3–C_6-cycloalkylthio; or phenylthio or benzylthio which is unsubstituted or substituted by halogen, C_1–C_4-alkoxy or nitro.

5. A method of controlling undesirable plants, wherein the plants and/or the area to be kept free of the plants are treated with a herbicidally effective amount of a cyclohexenone compound of the formula I as claimed in claim 1, where A is a radical NOR^3.

5,009,703

SILICON SMELTING PROCESS IN DIRECT CURRENT FURNACE

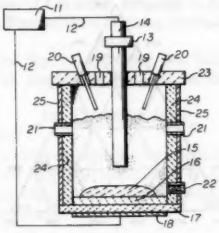
Arvid N. Arvidson; Vishu D. Dosaj, and James B. May, all of Midland, Mich., assignors to Dow Corning Corporation, Midland, N.J.

Filed Aug. 13, 1990, Ser. No. 566,911
Int. Cl.[5] C22B *4/00*
U.S. Cl. 75—10.36 **15 Claims**

1. A process for preparation of elemental silicon, the process comprising:

(A) adding a feed mixture comprising a source of silicon dioxide and a source of carbon to a substantially closed furnace:

(B) heating the substantially closed furnace with a direct current, submerged-arc; and



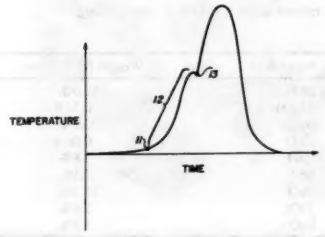
(C) tapping elemental silicon from the substantially closed furnace.

5,009,704

PROCESSING NICKEL-BASE SUPERALLOY POWDERS FOR IMPROVED THERMOMECHANICAL WORKING

Anthony Banik, Mesa, Ariz., assignor to Allied-Signal Inc., Morristownship, N.J.

Filed Jun. 28, 1989, Ser. No. 373,354
Int. Cl.[5] C22C *29/04*
U.S. Cl. 75—238 **8 Claims**



1. A process for preparing a consolidated nickel-based superalloy compact which may be forged at high strain rates comprising the steps of:

introducing said superalloy powder of known composition into a container;

evacuating and sealing the container containing the powder under a vacuum;

hot isostatically pressing the container to form a consolidated compact at a first temperature, time and pressure, said first temperature being above the incipient melting temperature of the powder to solutionize complex boride and carbide compounds but below the temperature necessary to solutionize the stable metal carbide phase during said time and pressure;

heating the compact to a second temperature below the incipient melting temperature;

holding the compact at said second temperature for a second period of time to homogenize the compact; and

cooling the compact to room temperature.

5,009,705

MICRODRILL BIT

Hironori Yoshimura, and Inada Shyogo, both of Tokyo, Japan, assignors to Mitsubishi Metal Corporation, Tokyo, Japan

Filed Dec. 28, 1989, Ser. No. 458,099
Int. Cl.[5] C22C *29/08*
U.S. Cl. 75—240 **3 Claims**

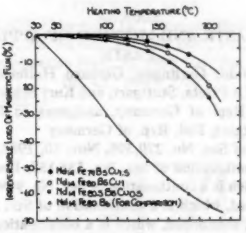
1. A miorodrill bit made of a tungsten carbide based cemented carbide which contains a binder phase of 6% by weight to 14% by weight of a cobalt alloy and a hard dispersed phase of balance tungsten carbide, said cobalt alloy being comprised of cobalt, chromium, vanadium and tungsten, and having weight ratios so as to satisfy the relationships of $0.04 \leqq (c+d)/(a+b+c+d) \leqq 0.10$ and $0.50 \leqq c/(c+d)$ 0.95, where a, b, c and d denote weight ratios of tungsten, cobalt, chromium and vanadium, respectively; said cemented carbide having a Rockwell A scale hardness of 92.0 to 94.0.

5,009,706

RARE-EARTH ANTISOTROPIC POWDERS AND MAGNETS AND THEIR MANUFACTURING PROCESSES

Hiroaki Sakamoto; Masahiro Fujikura, and Toshio Mukai, all of Kawasaki, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Continuation of Ser. No. 475,460, Feb. 6, 1990, abandoned. This application Jul. 18, 1990, Ser. No. 554,109
Claims priority, application Japan, Aug. 4, 1989, 1-202675
Int. Cl.[5] C22C *29/14*
U.S. Cl. 75—244 **18 Claims**



1. A rare-earth alloy anisotropic powder consisting essentially of, in atomic percent, over 12 percent and not more than 20 percent of R (R is at least one of neodymium and praseodymium or at least one of them and one or more rare-earth elements), not less than 4 percent and not more than 10 percent of boron, not less than 0.05 percent and not more than 5 percent of copper and the rest that consists essentially of iron and unavoidable impurities,

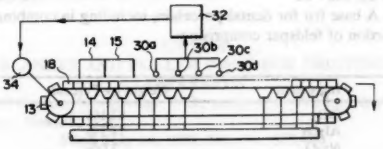
the alloy powder being made up of flat crystal grains having mean thickness h (the shortest measure), d not smaller than 0.01 μm and not larger than 0.5 μm and ratio d/h not smaller than 2, d being the mean measure of the grains taken at right angles to the widthwise direction thereof, and the alloy powder being magnetically anisotropic.

5,009,707

METHOD FOR MANUFACTURING AGGLOMERATES OF SINTERED PELLETS

Hidetoshi Noda; Makoto Gocho; Masayasu Shimizu; Osamu Komatsu, and Hideaki Inoue, all of Tokyo, Japan, assignors to NKK Corporation, Tokyo, Japan

Filed Dec. 29, 1989, Ser. No. 456,800
Claims priority, application Japan, Feb. 13, 1989, 1-33428; Feb. 13, 1989, 1-33429; Feb. 20, 1989, 1-39709
Int. Cl.[5] C22B *1/20*
U.S. Cl. 75—375 **14 Claims**



1. A method for manufacturing agglomerates of sintered pellets comprising the steps of:

mixing and pelletizing fine iron ore, flux, binder and return fines;

coating pelletized materials obtained in said step of the mixing and pelletizing with powdery solid fuel, thereby producing green pellets coated with powdery solid fuel;

charging said green pellets into a sintering machine;

drying said green pellets in a dry furnace on said sintering machine and igniting said green pellets in an ignition furnace;

sintering said green pellets on said sintering machine;

measuring a noise level by the use of a noise sensor placed at the ignition furnace, said noise level being indicated by means of a bursting sound produced by said green pellets when said green pellets are burst at the time of the ignition of said green pellets, and permeability of a sintering bed of the sintering machine being worsened when said noise level becomes high; and

taking operation control action in response to said noise level, said operation control action improving the permeability of the sintering bed.

5,009,708

PRINTING PASTE AND METHOD OF APPLYING SAID PASTE

Werner Grünwald, Gerlingen; Gerhard Holfelder, Weissach; Claudio De La Prieta, Stuttgart, and Kurt Schmid, Ditzingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 270,395, Nov. 10, 1988, abandoned, which is a continuation of Ser. No. 133,157, Dec. 11, 1987, abandoned, which is a continuation of Ser. No. 919,626, Oct. 15, 1986, abandoned, which is a continuation of Ser. No. 802,077, Nov. 26, 1985, abandoned, which is a continuation of Ser. No. 613,567, May 24, 1984, abandoned, which is a continuation-in-part of Ser. No. 427,601, Sep. 29, 1982, abandoned. This application Aug. 31, 1989, Ser. No. 403,040

Claims priority, application Fed. Rep. of Germany, Nov. 17, 1981, 3145583

Int. Cl.[5] **C09D** *5/10;* **C23C** *20/04*

U.S. Cl. 106—105 **19 Claims**

1. A printing paste suitable for application on a non-planar substrate, said paste being a thixotropic paste having a viscosity between about 6 and 8.5 pascal-seconds and consisting essentially of

a solid component in powder form, and

an organic carrier consisting essentially of between 4 and 9% by weight ethyl cellulose, between 74 and 82% alpha-terpineol, and between 8 and 17% benzyl alcohol, and

the relative proportions, by weight, between said solid component and said organic carrier being between 6:4 and 8:2.

5,009,709

STRONG DENTAL PORCELAIN AND METHOD FOR ITS MANUFACTURE

Robert L. Ibsen; Thomas C. Chadwick, and Sally A. Pritchard, all of Santa Maria, Calif., assignors to Den-Mat Corporation, Santa Maria, Calif.

Continuation of Ser. No. 244,853, Sep. 15, 1988, abandoned. This application Jul. 3, 1990, Ser. No. 548,294

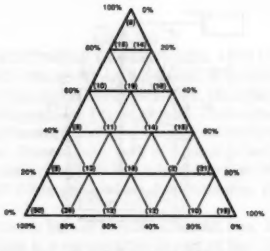
Int. Cl.[5] **A61C** *13/00, 13/083;* **C01K** *3/00*

U.S. Cl. 106—35 **13 Claims**

1. A base frit for dental porcelain, including in combination a portion of feldspar comprising:

Ingredient	Weight by Percent
SiO_2	67.1%
Al_2O_3	18.5%
Na_2O	3.0%
K_2O	10.5%, and
CaO	0.9%

mixed with a Glass 1, comprising:



FIRST FIRE FRIT FIRED AT 1820 °F

Ingredient	Weight by Percent
SiO_2	55.4%
Al_2O_3	7.19%
Na_2O	6.68%
K_2O	20.2%
MgO	1.92%
CaO	8.32%
SrO	0.05%
BaO	0.22%
TiO_2	0.02%

and then mixed with a Glass 2, comprising:

Ingredient	Weight by Percent
SiO_2	46.0%
Al_2O_3	0.74%
Na_2O	20.0%
K_2O	0.06%
CaO	3.8%
SrO	3.5%
BaO	12.5%
TiO_2	5.6%
B_2O_3	7.8%,

and then mixed with lithium carbonate.

5,009,710

ALGINATE COMPOSITION FOR APPLICATION TO A SOIL OR PLANT LOCUS

John A. Bewsey, Transvaal, South Africa, assignor to Harvest Chemicals (Proprietary) Limited, South Africa

Continuation of Ser. No. 196,627, May 19, 1988, abandoned. This application Oct. 30, 1989, Ser. No. 428,432

Int. Cl.[5] **C05B** *37/04, 17/00, 3/00*

U.S. Cl. 106—208 **6 Claims**

1. A thixotropic composition for application to a plant locus, comprising

a gel comprising water, an alkaline earth metal alginate gel matrix uniformly dispersed throughout the water, bentonite, and at least about 0.05 percent by weight of insolubles having a particle size less than about 70 microns, wherein the weight ratio of the alginate gel to the bentonite is about 1:1 to 1:10, the water is present in an amount of at least about 90 wt % of the gel and the alginate gel matrix is present in an amount of up to about 5 wt % by weight of the gel.

5,009,711

GOLDEN COLOR LUSTER PIGMENTS

Ralf Emmert, Bayonne, N.J., and Manfred Weigand, Darmstadt, Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit Beschrankter Haftung, Darmstadt, Fed. Rep. of Germany

Filed Sep. 12, 1988, Ser. No. 243,540

Claims priority, application Fed. Rep. of Germany, Sep. 11, 1987, 3730505

Int. Cl.[5] C04B *14/20*

U.S. Cl. 106—415 20 Claims

1. A lustrous, colored pigment, comprising a lamellar substrate coated with a topmost metal oxide layer containing both titanium and iron wherein said metal oxide layer consists essentially of pseudobrookite.

5,009,712

NON-MAGNETIC PIGMENTS

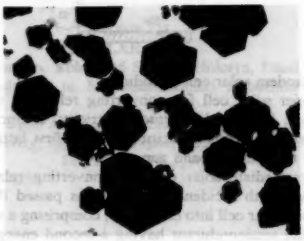
Kousaku Tamari, and Tsutomu Katamoto, both of Hiroshima, Japan, assignors to Toda Kogyo Corp., Hiroshima, Japan

Filed Dec. 14, 1989, Ser. No. 448,196

Claims priority, application Japan, Dec. 23, 1988, 63-326420; Nov. 7, 1989, 1-290783; Nov. 7, 1989, 1-290784

Int. Cl.[5] C09C *1/22*

U.S. Cl. 106—456 18 Claims



1. A non-magnetic pigment comprising plate-like potassium ferrite particles having and average diameter of 0.03–30.0 μm.

5,009,713

CEMENT COMPOSITION AND A PROCESS FOR PREPARATION THEREOF

Masaharu Sakuta, Tokyo; Toshiharu Urano, Nagoya; Kyoichi Tanaka; Masashi Sugiyama, both of Ibaraki; Shyuzo Endoh, Tokyo, and Keisuke Fujioka, Kawasaki, all of Japan, assignors to Fujisawa Pharmaceutical Company, Ltd.; Takenaka Komuten Company, Ltd., both of Osaka and Nippon Nyukazai Company, Ltd., Tokyo, all of, Japan

Filed Feb. 13, 1987, Ser. No. 14,593

Claims priority, application Japan, Feb. 25, 1986, 61-038277

Int. Cl.[5] C04B *7/00*

U.S. Cl. 106—727 9 Claims

1. A hydraulic cement composition comprising, as a carbonation inhibitor of the cement composition, at least one compound of the formula (I):

$$A\text{-}(Y_n\text{-}H)_l \quad (I)$$

wherein A is a polyamine residue containing 2–10 carbon atoms,

Y is $-C_3H_6O-$,

l is a number equal to 1–8,

n is a number equal to 1–4,

the product n×l is equal to 13–20,

the active hydrogen(s) involved in the amino groups in the polyamine residue being partly or wholly substituted with the residue(s) of propylene oxide.

5,009,714

PROCESS FOR REMOVING COPPER AND COPPER OXIDE DEPOSITS FROM SURFACES

Stephen T. Arrington, and Gary W. Bradley, both of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Aug. 25, 1989, Ser. No. 398,687

Int. Cl.[5] C03C *23/00*

U.S. Cl. 134—2 18 Claims

1. A process for removing copper from a surface comprising:

contacting the copper with sufficient quantities of gaseous oxygen such that copper oxide is formed; and contacting the copper oxide with a solution

comprising said gaseous oxygen and sufficient amounts of ammonia and an inorganic ammonium salt to dissolve at least a substantial portion of the copper oxide.

5,009,715

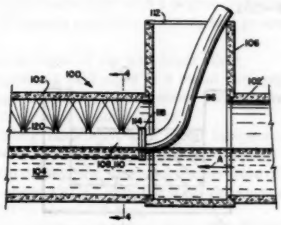
METHOD FOR PREVENTING DETERIORATION OF CONCRETE PIPE

R. E. Wilson, 678 Alderwood Dr., Newport Beach, Calif. 92660

Division of Ser. No. 44,405, Apr. 30, 1987, Pat. No. 4,899,770. This application Nov. 20, 1989, Ser. No. 438,310

Int. Cl.[5] B08B *3/02*

U.S. Cl. 134—22.11 23 Claims



1. A method of cleansing away concrete deteriorating acid from interior wall surfaces of concrete sewer conduit, in a sewerage system, normally unwashed by a flow of sewerage therethrough, comprising: introducing a plurality of spray-forming nozzle means into and spaced-apart along said concrete sewer conduit; orienting said nozzle means within said sewer conduit such that spray formed by cleansing fluid passing from said nozzle means will contact and wash said normally unwashed interior wall surfaces of said concrete conduit; connecting said nozzle means via tubular means to a pressurized source of cleansing fluid; and thereby causing said cleansing fluid to flow to said nozzle means; leaving said nozzle means within said concrete sewer conduit a sufficient period of time to enable a spraying operation of cleansing fluid from said nozzles, which can be a continuous operation, during the course of utilization of said concrete sewer conduit in the sewerage system; whereby a spray of said cleansing fluid formed by said nozzle means will wash from said interior wall surfaces concrete deteriorating acid introduced by any means including acid forming bacteria thereby prolonging the useful life of said concrete sewer conduit.

5,009,716

BLANKET AND ROLLER WASH FOR PRINTING APPARATUS

David Gerson, Woodbridge, N.J., assignor to Printers' Service, Inc., Newark, N.J.

Filed May 16, 1989, Ser. No. 352,466

Int. Cl.[5] B08B *3/08*

U.S. Cl. 134—40 6 Claims

1. A method for removing paste ink from printing rollers and blankets, comprising:

(a) applying a blanket and roller wash to an inked surface of

a printing roller or blanket, wherein said wash consists essentially of at least 1% by volume of a nonionic surfactant having a hydrophilic/lipophilic balance of 8.5 to 17.5, 7–97.25% by volume of a monobasic fatty acid having 12 to 20 carbon atoms, and 0–92% by volume of a mineral oil selected from the group of saturated hydrocarbon oils that have a viscosity no higher than 165 SSU at 100° F. and a vapor pressure no higher than 0.1 mm Hg at 20° C.;

(b) allowing said wash to coat said surface and penetrate the ink thereon;

(c) removing material from said surface;

(d) applying additional portions of said wash to said surface until the material that is removed from said surface is substantially clear; and

(e) applying water to said surface until said surface is free of any oily residue.

5,009,717

THERMOELECTRIC ELEMENT AND METHOD OF MANUFACTURING SAME

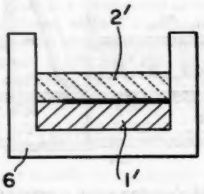
Masashi Komabayashi; Kunio Kuramochi, and Kenichi Hijikata, all of Ohmiya, Japan, assignors to Mitsubishi Metal Corporation, Tokyo, Japan

Filed Jul. 11, 1990, Ser. No. 550,879

Claims priority, application Japan, Jul. 18, 1989, 1-185767; Apr. 11, 1990, 2-95868; Apr. 25, 1990, 2-109802

Int. Cl.[5] H01L *35/34, 35/12*

U.S. Cl. 136—201 **7 Claims**



1. In a thermoelectric element comprising a first layer of a p-type iron silicide, a second layer of an n-type iron silicide, said first and second layers being joined together to form a pn junction therebetween, and an insulating layer of an oxide interposed between said first and second layers portions thereof other than said pn junction, the improvement wherein said oxide forming said insulating layer consists essentially of:

SiO_2: 38.0–50 % by weight;

B_2O_3: 0.1–10.0 % by weight; and

MgO and inevitable impurities: the balance.

5,009,718

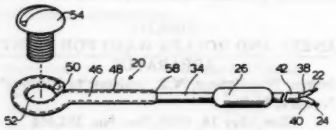
THERMOCOUPLE CONSTRUCTION

Harald H. Schmidt, Georgetown, Canada, assignor to Mold-Masters Limited, Georgetown, Canada

Filed Dec. 22, 1988, Ser. No. 288,441

Int. Cl.[5] H01L *35/02*

U.S. Cl. 136—232 **6 Claims**



1. In a thermocouple assembly for measuring temperature adjacent the forward end thereof, the thermocouple assembly having a pair of wires formed of dissimilar metals extending through electrical insulating material in a thin metal sheath to a junction adjacent the forward end of the assembly, the improvement wherein:

a forward portion of the sheath is retainably received in a casing having a closed forward end, the casing and the enclosed portion of the sheath being bent to a shape suitable to receive connecting means therethrough in order to accurately secure the forward end of the thermocouple assembly within said bent portion and in a desired position during use.

5,009,719

TANDEM SOLAR CELL

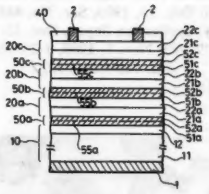
Susumu Yoshida, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Nov. 8, 1989, Ser. No. 433,278

Claims priority, application Japan, Feb. 17, 1989, 1-38691

Int. Cl.[5] H01L *31/068*

U.S. Cl. 136—249 **9 Claims**



1. A tandem solar cell including:

an upper solar cell for converting relatively short wavelength incident light into electricity, comprising a first crystalline semiconductor having a first lattice constant and first energy band gap;

an intermediate solar cell for converting relatively long wavelength incident light that has passed through said upper solar cell into electricity, comprising a second crystalline semiconductor having a second energy band gap smaller than the first energy band gap;

a lower solar cell for converting relatively long wavelength incident light that has passed through said intermediate solar cell into electricity, comprising a third crystalline semiconductor having a third energy band gap smaller than the second energy band gap; and

crystalline semiconductor buffer layers respectively disposed between said upper and intermediate solar cells and between said intermediate and lower solar cells, each buffer layer having an energy band gap larger than the first energy band gap and a lattice constant approximately the same as the first lattice constant and including a tunneling junction within each of said buffer layers.

5,009,720

SOLAR CELL

Shigeru Hokuyo; Takao Oda, and Hideo Matsumoto, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Nov. 9, 1989, Ser. No. 437,981

Claims priority, application Japan, Nov. 16, 1988, 63-290990; Aug. 19, 1989, 1-213628

Int. Cl.[5] H01L *31/06, 31/18*

U.S. Cl. 136—255 **15 Claims**

1. A solar cell comprising:

a semiconductor substrate of a first conductivity type having opposed first and second major surfaces;

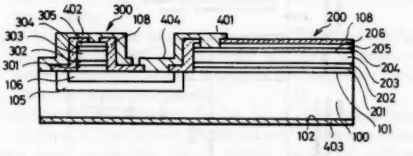
a first region of a second conductivity type extending from a portion of said first major surface into said substrate;

a second region of the first conductivity type disposed within said first region and including said first major surface;

a photovoltaic section disposed on said first major surface

and spaced from said first region including a first compound semiconductor layer of the first conductivity type and a second compound semiconductor layer of the second conductivity type disposed on said first compound semiconductor layer;

a diode section disposed within said second region of first conductivity type and including diode regions of first and second conductivity type;



a first electrode connecting said second compound semiconductor layer in reverse polarity to said diode section through said second region of first conductivity type; and

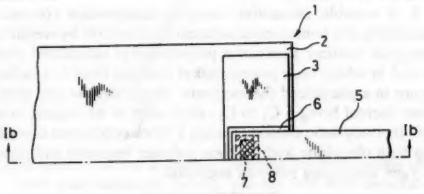
a second electrode disposed on said first major surface of said substrate whereby said diode region of second conductivity type is electrically connected to said first conductivity type substrate.

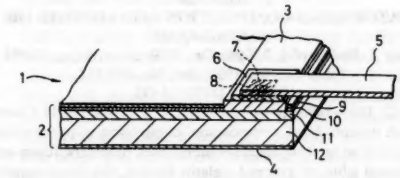
5,009,721

SOLAR CELL

Hideo Matsumoto, Kobe, and Shigeru Hokuyo, Itami, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Aug. 2, 1989, Ser. No. 388,381
Claims priority, application Japan, Aug. 26, 1988, 63-212905
Int. Cl.[5] H01L *31/05*
U.S. Cl. 136—256 **7 Claims**





1. A solar cell for use in a device in which a plurality of solar cell elements are interconnected, comprising:

a solar cell element for converting light into electricity, including a photoresponsive junction in a semiconductor body and first and second electrodes disposed on said body, an interconnector for interconnecting said solar cell elements to another solar cell element, joined to said first electrode, and a metal film disposed between and welded to said first electrode and said interconnector, wherein the welded area between said metal film and said first electrode is about three times the welded area between said metal film and said interconnector.

5,009,722

PROCESS FOR PRODUCING BASE MATERIAL FOR AN ALUMINUM OFFSET PRINTING PLATE

Gerhard Sprintschnik, Taunusstein; Walter Niederstaetter, Eltville; Kurt Reiss, Wiesbaden; Wolfgang von Asten, Pulheim; Gunther Scharf, Boon, and Barbara Grzembra, Bonn, all of Fed. Rep. of Germany, assignors to Hoechst AG, Frankfurt am Main and Vereinigte-Aluminum Werke A.G., Bonn, both of, Fed. Rep. of Germany

Division of Ser. No. 186,152, Apr. 26, 1988, Pat. No. 4,945,004. This application May 23, 1990, Ser. No. 527,567
Claims priority, application Fed. Rep. of Germany, Apr. 28, 1987, 3714059
Int. Cl.[5] C22F *1/04*
U.S. Cl. 148—2 **10 Claims**

1. A process for producing a base material for aluminum offset printing sheets which base material comprises an aluminum alloy consisting of from about 0.2 to about 0.6% by weight of iron, less than about 0.25% by weight silicon and copper combined, from about 0.1 to about 0.3% by weight manganese and the remainder being aluminum and trace production impurities, said base material further characterized as containing secondary precipitates in the form of phases of Al Mn Si: Al Fe: Al Mn which bear a ratio to one another of from about 1:1:2 to about 1:1:3, the mean particle size of said phases being from about 0.05 to about 0.10 micron with a maximum particle size of less than about 0.3 micron and further containing a precipitation structure with a degree of dispersion of less than about 50 phases per cubic micron, said process comprising:

(a) casting an ingot of the aluminum alloy;

(b) homogenizing said ingot at a metal temperature within the range of about 550° to about 600° C. for a soaking period of at least about 4 hours;

(c) hot rolling said ingot at a metal temperature of from about 460° to about 550° C. to form a sheet;

(d) hot strip rolling said sheet at a temperature of from about 300° to about 330° C. until the sheet thickness ranges from about 2.5 to about 3.5 mm;

(e) cooling said sheet to below about 30° C.; and

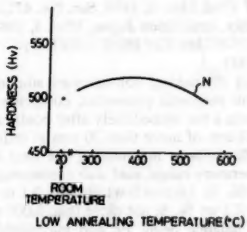
(f) subjecting said sheet to a cold rolling process until a final sheet thickness ranging from about 0.5 to about 1.0 mm is obtained.

5,009,723

METHOD FOR MANUFACTURING HIGH STRENGTH NON-MAGNETIC STAINLESS STEEL

Yoshinobu Honkura, Kounan; Toru Matsuo, and Kouji Murata, both of Tokai, all of Japan, assignors to Aichi Steel Works, Ltd, Aichi, Japan

Division of Ser. No. 222,382, Jul. 19, 1988, abandoned, which is a continuation of Ser. No. 6,241, Jan. 20, 1987, abandoned, which is a continuation of Ser. No. 714,044, Mar. 18, 1985, abandoned. This application Jul. 5, 1989, Ser. No. 375,460
Claims priority, application Japan, Mar. 20, 1984, 59-53695
Int. Cl.[5] C21D *8/00*
U.S. Cl. 148—12 E **7 Claims**



1. A method for manufacturing a high strength non-magnetic stainless steel comprising the steps of preparing a steel

composed of, by weight, not more than 0.20% carbon, not more than 1.00% silicon, 14–16% manganese, not more than 0.003% sulfur, 0.2–1.0% nickel, 15–19% chromium, 0.30–0.40% nitrogen, the remainder being iron together with impurities said carbon and said nitrogen constituting 0.40–0.55% and the manganese equivalent being 30–33 and drawing said steel at a reduction of area in a range of 50–70%.

5,009,724

SOLDERING FLUX AND METHOD OF ITS USE IN FABRICATING AND ASSEMBLING CIRCUIT BOARDS

Courtney V. Dodd, Oklahoma City, Okla., and Gregory C. Munie, Naperville, Ill., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jul. 2, 1990, Ser. No. 546,646
Int. Cl.[5] B23K *35/34*
U.S. Cl. 148—23 18 Claims

1. A water-soluble soldering flux, which, when applied to a circuit board, does not degrade the surface insulation resistance of the board following the soldering and subsequent cleaning thereof, comprising:

a water-soluble vehicle;

an activator; and

a hydrophobic surfactant which is preferentially adsorbed by the surface of the circuit board over the vehicle and the activator to render the surface substantially hydrophobic.

5,009,725

FLUXING AGENTS COMPRISING β-DIKETONE AND β-KETOIMINE LIGANDS AND A PROCESS FOR USING THE SAME

Thomas L. Ellison, San Jose; David A. Roberts, Carlsbad, both of Calif.; John C. Ivankovits, Northampton, and John A. T. Norman, Whitehall, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Mar. 30, 1990, Ser. No. 502,209
Int. Cl.[5] B23K *35/34*
U.S. Cl. 148—23 20 Claims

1. A process for fluxing an article having at least a portion of a surface coated with a metal species comprising contacting the portion of the article to be fluxed with an effective amount of a β-diketone or β-ketoimine ligand at at temperature sufficient to form a metal-ligand complex on the surface of the article to be fluxed and removing the resultant metal-ligand complex from the surface of the article by sublimation rendering the surface of the article substantially free of the surface coating.

5,009,726

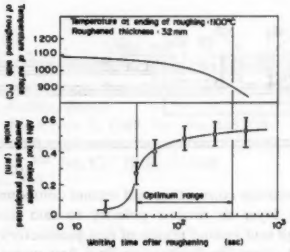
METHOD OF MAKING NON-ORIENTED SILICON STEEL SHEETS HAVING EXCELLENT MAGNETIC PROPERTIES

Akihiko Nishimoto; Yoshihiro Hosoya; Kunikazu Tomita; Toshiaki Urabe, and Masaharu Jitsukawa, all of Tokyo, Japan, assignors to NKK Corporation, Tokyo, Japan

PCT No. PCT/JP89/00232, § 371 Date Oct. 12, 1989, § 102(e) Date Oct. 12, 1989, PCT Pub. No. WO89/08151, PCT Pub. Date Sep. 8, 1989
PCT Filed Mar. 3, 1989, Ser. No. 427,128
Claims priority, application Japan, Mar. 4, 1988, 63-49576
Int. Cl.[5] H01F *1/047*
U.S. Cl. 148—111 3 Claims

1. A method of making non-oriented silicon steel sheets having excellent magnetic properties, comprising roughing a slab so as to form a bar immediately after continuously casting thereof to thickness of more than 20 mm at reduction rate of more than 10% without maintaining the heat or heating at specified temperature range, said slab containing C: not more than 0.005 wt %, Si: 1.0 to 4.0 wt %, Mn: 0.1 to 1.0 wt %, P: not more than 0.1 wt %, S: not more than 0.005 wt %, Al: 0.1 to 2.0 wt %, balance being Fe and inavoidable impurities; having a time interval of more than 40 sec at temperature range where the surface temperature of the roughed bar is more than 900° C. till a following finish rolling; performing a final rolling and coiling so as to form a coiled plate at temperature of not more than 650° C.; annealing the hot rolled plate by soaking it at the temperature of 800° to 950° C. for a time satisfying

$$\exp(-0.022T+21.6) \leqq t \leqq \exp(-0.030T+31.0)$$



wherein,

T: soaking temperature (° C.)

T: soaking time (min), carrying out a cold rolling of once or old rollings of more than twice interposing an intermediate annealing and a final continuous annealing at range of temperature between 850° and 1100° C.

5,009,728

CASTABLE, INSENSITIVE ENERGETIC COMPOSITIONS

May L. Chan, and Alan D. Turner, both of Ridgecrest, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 12, 1990, Ser. No. 464,076
Int. Cl.[5] C06B *45/10*
U.S. Cl. 149—19.1 16 Claims

1. A castable, insensitive energetic composition consisting essentially of a homogenous solution of 65 to 85% by weight of energetic oxidizer solids of a polynitroalkyl substituted compound in which each poltnitroalkyl contains from 1–5 carbon atoms in a plasticized thermoplastic elastomer, the said plasticizer thereof being a C_1 to C_{10} alkyl ester of an organic acid, said thermoplastic elastomer being a block copolymer containing both oleophilic hydrocarbon polymer segments and polar, oxygen containing polymer segments.

5,009,729

MATCH HEAD COMPOSITION AND METHOD OF MAKING SAME

Stanley J. Radkowski, 7 Katie Dr., Wilbraham, Mass. 01095

Filed Oct. 22, 1990, Ser. No. 600,742
Int. Cl.[5] D03D *23/00*
U.S. Cl. 149—109.4 14 Claims

1. A match head composition comprising a pyrotechnic mixture of an igniting agent, combustibles, oxidizers, fillers and an animal glue or colored gelatin binder, the improvement which comprises the addition of sodium dithionite and a crosslinking agent selected from the group consisting of dichromates, dialdehydes or a mixture of both to said mixture.

5,009,730

SYSTEM OF RESTORING ROUGH TOOL HANDLES

Michel C. Tozier, P.O. Box 858, Durham, Calif. 95938

Continuation-in-part of Ser. No. 279,970, Dec. 5, 1988, abandoned. This application Oct. 2, 1989, Ser. No. 416,036
Int. Cl.[5] B32B *31/26*
U.S. Cl. 156—85 8 Claims

1. A system of restoring a smoother, splinter free gripping

surface to a wooden tool handle having become roughened with defects, wherein the defects are utilized to create a textured, non-slip said gripping surface on the tool handle, said system comprising in combination:

utilizing a heat shrinkable tubing of a thin walled nature and having a recovery temperature range between about 180 and 240 degrees fahrenheit;

said heat shrinkable tubing further having a generally larger expanded internal diameter than the external diameter of the tool handle to allow slipping of said tubing over the tool handle;

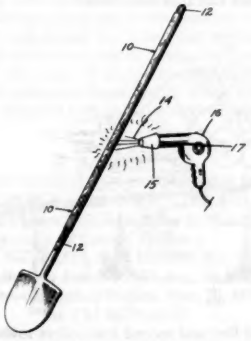
said heat shrinkable tubing further having a shrinkage ratio and expanded internal diameter allowing a recovered internal diameter of said tubing to less than the external diameter of the tool handle;

said heat shrinkable tubing further being of sufficient length to cover at least a hand placement area of the tool handle;

said heat shrinkable tubing further being of sufficient strength to generally resist puncture by the defects on the tool handle;

said heat shrinkable tubing further being of a sufficient said thin walled nature and of sufficient pliability during heating thereof to conform to the tool handle and the defects thereof;

said heat shrinkable tubing further being of a sufficient rigidity after heating to fixedly adhere to the tool handle;



said system further including inserting the tool handle into said heat shrinkable tubing, placing said heat shrinkable tubing over the hand placement area of the tool handle, heating said heat shrinkable tubing with heat;

said heat being supplied from a common household handheld hair dryer having a universally fitting auxiliary air concentration nozzle removably attached thereto, said air concentration nozzle being conically shaped having a larger end thereof fitted over an air discharge barrel of said hair dryer, a narrow end of said air concentration nozzle being smaller in diameter than said barrel of said hair dryer, said narrow end of said air concentration nozzle having means to concentrate heat ejected from said barrel of said hair dryer to cause recovery of said heat shrinkable tubing onto the handle;

application of said heat from said hair dryer with attached said air concentration nozzle for a sufficient period of time to reduce said internal diameter of said heat shrinkable tubing to said recovered diameter;

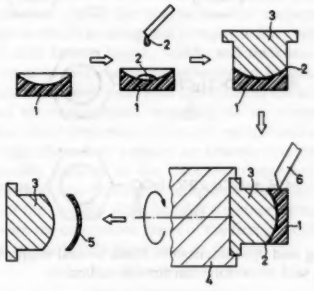
said thin walled nature and pliability providing means to allow said heat shrinkable tubing to conform to the tool handle during said heating as to allow the defects of the tool handle to extend into said heat shrinkable tubing creating said textured non-slip gripping surface on the tool handle in the area of the heat shrinkable tubing.

5,009,731

ULTRAVIOLET-HARDENABLE ADHESIVE AND BONDING METHOD EMPLOYING SAME

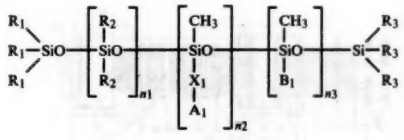
Toshiharu Yoshikawa, Nagoya, and Shozou Sugiura, Toyoake, both of Japan, assignors to Menicon Co., Ltd., Aichi, Japan

Filed Oct. 25, 1989, Ser. No. 426,199
Int. Cl.[5] B32B *31/00*
U.S. Cl. 156—154 **14 Claims**



1. A method of bonding a water-swellable, ophthalmic-lens blank to a support member so as to subject the ophthalmic-lens blank to working and/or treatment, in producing a water-swellable ophthalmic lens, comprising the steps of:

preparing an ultraviolet-hardenable adhesive comprising at least one photo-hardenable silicone oil and at least one photoinitiator, said at least one silicone oil being selected from the group consisting of polysiloxanes represented by the following general formula (I):



, wherein each of R_1 to R_3 is methyl or ethyl; n_1, n_2 and n_3 are positive integers, respectively, which satisfy the following formulas:

$$40 \leqq n_1 + n_2 + n_3 \leqq 1500$$

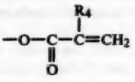
$$0.04 \leqq \frac{n_2}{n_1 + n_2 + n_3} \leqq 0.6$$

$$0.002 \leqq \frac{n_3}{n_1 + n_2 + n_3} \leqq 0.2;$$

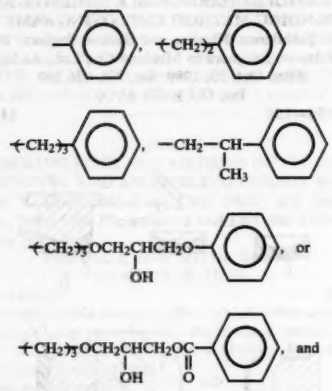
X_1 is

$$+CH_2\rangle_3, \quad \text{or} \quad +CH_2\rangle_3OCH_2CHCH_2-;$$
$$\qquad\qquad\qquad\qquad\qquad\qquad\qquad\quad |$$
$$\qquad\qquad\qquad\qquad\qquad\qquad\qquad\quad OH$$

A_1 is



, wherein R_4 is hydrogen or methyl; and B_1 is



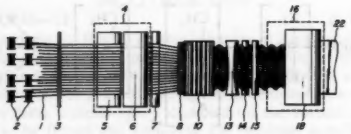
bonding said ophthalmic-lens blank to said support member with said ultraviolet-hardenable adhesive.

5,009,732

METHOD OF MANUFACTURING MEMBER FOR USE IN TIRE INCLUDING ENGAGING WIRES BETWEEN GEARS

Kazunari Ikeda, and Koichi Sanada, both of Tokyo, Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed Apr. 28, 1989, Ser. No. 344,647
Int. Cl.[5] B29C *65/00*
U.S. Cl. 156—177 **10 Claims**



1. A method of manufacturing a member for use in a tire, comprising steps of arranging wires in a predetermined spaced relationship one to the others by means of a guide plate, extending the wires about rolls of a winding brake unit, aligning the wires by passing them through a comb roll, engaging the wires between a pair of gears arranged immediately downstream of the comb roll and driven at equal speeds to set said wires in wave-shapes, arranging the wires in a belt-shape in an appropriate width as a whole by passing the wires about a concaved roll, extending the wires about flat rolls such that the wave-shapes of the wires fall onto a common plane and do not touch each other, and then coating the wires with rubber.

5,009,733

PROCESS FOR FABRICATING A CIRCULAR FRAME

Mieko Sakai, 12-8, Shinbashi 6-chome, Minato-ku, Tokyo, Japan

Filed Jun. 28, 1989, Ser. No. 373,307
Claims priority, application Japan, Jul. 11, 1988, 63-173423
Int. Cl.[5] B27H *1/00*
U.S. Cl. 156—184 **2 Claims**

1. A process for bending and pressing a multi-layer circular frame from flat strips of wooden boards using a machine which includes:

a cylindrical forming shell removably mounted to a support rotation about an axis of the cylindrical shell;

a plurality of pressing rolls disposed opposite said forming shell and spaced circumferentially around said forming shell, said pressing rolls being movable between a position spaced radially outward of said forming shell to a position adjacent said forming shell;

a first free roller movable radially toward and away from said cylindrical shell and located between a first pressing roll and an adjacent second pressing roll;

a second free roller located between said second pressing roll and a next adjacent third pressing roll, said second free roller being movable radially toward and away from said cylindrical shell;

an elongate feeder having one end disposed for delivering one end of a flat strip of wooden board toward said first free roller, said one end of said elongate feeder having a first reed fixed thereto and being movable toward and away from said cylindrical shell, and

a second reed movable toward and away from a circumferential portion of said cylindrical shell between a last one of said pressing rolls and said one end of said elongate feeder,

comprising the steps of:

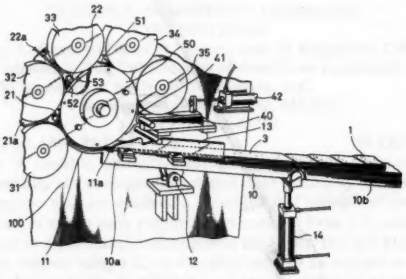
mounting a cylindrical forming shell to said support;

moving said first reed, said first and second free rollers and said plurality of pressing rolls to positions spaced radially outward from said cylindrical shell while moving said second reed toward said cylindrical shell;

providing a single flat strip of wooden board free of adhesive material to said elongate feeder;

moving said one end of said elongate feeder away from said cylindrical shell;

moving a forward end of said flat strip over said first reed and beyond said first free roller;



moving said first and second free rollers toward said cylindrical shell to clamp said forward end of said flat strip between said first free roller and said cylindrical shell;

moving said one end of said elongate feeder toward said cylindrical shell to press a portion of said flat strip to said cylindrical shell with said first reed;

moving said plurality of pressing rolls to their respective positions adjacent said forming shell;

rotating said cylindrical forming shell and said plurality of pressing rolls to wrap said flat strip of wooden board around said cylindrical forming shell;

providing a layered strip of wooden board to said elongate feeder, said layered strip of wooden board having adhesive applied thereto,

continuing rotation of said cylindrical forming shell and said plurality of pressing rolls and feeding the layered strip toward the first reed and then advancing the layered strip through contact with said first and second reeds, said first and second free rollers and said plurality of pressing rolls to wrap said layered around said wrapped wooden board;

moving said first and second reeds, said first and second free rollers and said plurality of pressing rolls to their respective positions spaced radially outward from said cylindrical forming shell; and

withdrawing said cylindrical forming shell and said wrapped, multi-layer wooden circular frame from said support.

2. Apparatus for bending and pressing a multi-layer circular frame from flat strips of wooden source material comprising:

a cylindrical forming shell removably mounted to a support for rotation about an axis of the cylindrical shell,

a plurality of pressing rolls disposed opposite said forming shell and circumferentially spaced around said forming shell, said pressing rolls being movable between a position spaced radially outward of said forming shell to a position adjacent said forming shell;

a first free roller movable radially toward and away from said cylindrical shell and located between a first pressing roll and an adjacent second pressing roll;

a second free roller located between said second pressing roll and a next adjacent third pressing roll, said second free roller being movable radially toward and away from said cylindrical shell;

an elongate feeder having one end disposed for delivering one end of a flat strip of wooden source material toward said first free roller, said one end of said elongate feeder having a first reed fixed thereto and being movable toward and away from said cylindrical forming shell; and,

a second reed located between a last one of said plurality of pressing rolls and said one end of said elongate feeder, said second reed being mounted for movement toward and away from a circumferential portion of said cylindrical forming shell;

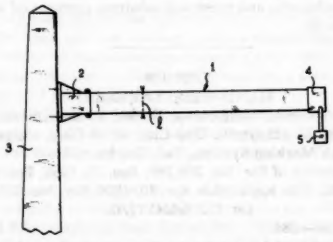
whereby one end of a strip of source material is fed between said first pressing roll and said cylindrical shell to contact said first free roller, said first free roller is moved to move said one end of said source material toward said cylindrical forming shell to initiate a bending and lapping movement of said one end of said source material on said cylindrical shell and second free roller, said pressing rolls and said second reed are moved to contact and press an outer surface of said strip of source material radially inward against said cylindrical forming shell as said strip of source material is wrapped around said cylindrical forming shell.

5,009,734

METHOD OF MAKING AN INSULATING SUPPORT ARM FOR AN ELECTRIC LINE POLE

Michel Thérond, Cahors, France, assignor to Manufacture d'Appareillage Electrique de Cahors, France

Division of Ser. No. 168,510, Mar. 15, 1988, Pat. No. 4,867,399.
This application Jun. 29, 1989, Ser. No. 373,162
Claims priority, application France, Mar. 20, 1987, 87 03885
Int. Cl.[5] B27N *3/00*
U.S. Cl. 156—184 **4 Claims**



1. A method for making an elongated insulating support arm having a preselected length dimension, a preselected constant width dimension, and a preselected maximum thickness dimension substantially less than the width dimension, for cantilevered mounted on an electric pole to support an electric line extending substantially parallel to the thickness dimension of the arm, the method comprising the steps of:

providing an at least two-ply sheet having a first dimension equal to the desired length of the support arm and a second dimension perpendicular to the first dimension, the sheet being composed of a first ply of continuous fibers extending parallel to the first dimension and a second ply of randomly-oriented short fibers impregnated with a polymerizable resin;

winding the sheet onto itself parallel to the first dimension to form a flattened roll having length, width, and thickness dimensions approximately equal to the respective preselected length, width, and thickness dimensions of the support arm;

preheating the wound roll to a temperature lower than the polymerization temperature of the impregnating resin; and

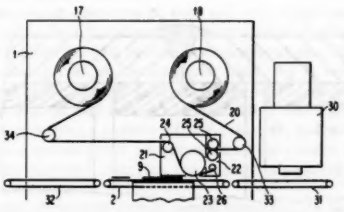
curing the preheated wound roll in a mold under pressure at a temperature above the polymerization temperature of the resin to obtain an elongated composite fiber-reinforced support arm having length, width, and thickness dimensions equal to said respective preselected length, width, and thickness dimensions, with a first end of the arm being adapted for cantilevered mounting on an electric pole with the width dimension of the arm vertical and a second end being adapted to support an electric line extending substantially parallel to the thickness dimension of the arm, the thickness dimension being made up of successive layers of the two-ply sheet bonded together by the cured resin, with the continuous fibers of the first plies extending parallel to the length dimension of the arm.

5,009,735

PROCESS FOR PEELING PROTECTIVE FILM OFF A WAFER

Minoru Ametani; Keigo Funakoshi; Akihiko Kira; Takao Matsushita, and Keizo Shirakura, all of Osaka, Japan, assignors to Nitto Denko Corporation, Osaka, Japan

Filed Nov. 28, 1988, Ser. No. 276,587
Claims priority, application Japan, Nov. 28, 1987, 62-300621; Nov. 10, 1988, 63-285480
Int. Cl.[5] B32B *31/18*
U.S. Cl. 156—241 **7 Claims**



1. A process for peeling a protective film stuck to an upper side of a wafer, comprising feeding a wafer with a protective film stuck thereon to a table and holding the wafer in position on the table, adhering an adhesive tape to an upper side of a rear end of said protective film stuck on the wafer by means of a press roller, lifting the press roller, so that the press roller no longer presses against said protective film, and moving said press roller forward, moving a peeling unit forward to peel the adhesive tape together with the protective film stuck thereto, and then carrying away the wafer form the table.

5,009,736

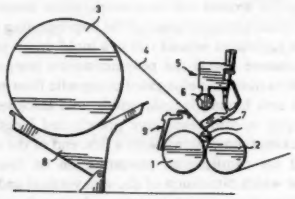
METHOD OF AND AN ARRANGEMENT FOR GLUING A WEB TO A CORE IN A REELING DEVICE

Jorma Lehto, Inkeroinen, Finland, assignor to Oy Tampella AB, Tampere, Finland

Filed Nov. 6, 1989, Ser. No. 431,789
Claims priority, application Finland, Nov. 18, 1988, 885355
Int. Cl.[5] B32B *31/18*
U.S. Cl. 156—250 **4 Claims**

1. A method of fastening a web (4) to a core (10) in a reeling device, comprising transferring a reeled web reel (3) from support rolls (1, 2) into a lowering bucket (8); transferring a

new core (10) in a core chute (9) on to the support rolls (1, 2) from between the lowering bucket (8) and the support rolls (1, 2) before the web (4) is cut off between the reeled web reel (3) and a new reel to be reeled, the web (4) between the reeled web reel (3) and the support rolls (1, 2) passing above the core (10); cutting off the web (4) between the core (10) and the reeled



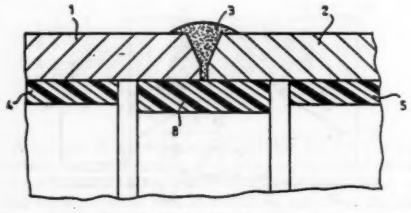
web reel (3); and fastening the web to the core (10), characterized in that before the web is cut off, glue is spread between the core (10) and the web (4) from above the core (10), the web (4) being pressed against the core (10) so that it adheres to it and the web (4) being cut off only after it has adhered to the core (10).

5,009,737

METHOD OF JOINING PIPES AT THEIR ENDS TO FORM A PIPELINE

Pierre L. Lescaut, Bernay, France, assignor to Atochem, Puteaux, France

Continuation of Ser. No. 182,215, Apr. 15, 1988, abandoned. This application Jun. 1, 1989, Ser. No. 360,155
Claims priority, application France, Apr. 16, 1987, 87 05446
Int. Cl.[5] B29C *63/30*
U.S. Cl. 156—264 **10 Claims**



1. A method of producing a pipeline arrangement, comprising the steps of:

positioning first and second metal pipe sections in end-to-end relationship, each having a radially inner wall and an axial end, said radially inner walls having heat-sensitive coverings of substantially equal diameter, at least one of said coverings terminating axially inwardly of said axial end of its respective pipe section to define an uncovered inner wall section situated between adjacent longitudinal ends of said coverings,

welding said ends together,

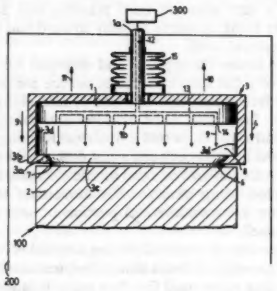
introducing a strip of fusible material radially inside of said uncovered inner wall section, said strip having a longitudinal width of 0.60 to 0.90 times that of said uncovered inner wall section and a radial thickness of 1.10 to 1.65 times that of said heat-sensitive coverings, and heating said strip while applying radially outwardly directed pressure to a radially inner surface of said strip to push said strip against said uncovered inner wall section for reducing said radial thickness and increasing said longitudinal width of said strip to cause said strip to contact said adjacent longitudinal ends of said coverings and completely cover said uncovered inner wall section.

5,009,738

APPARATUS FOR PLASMA ETCHING

Heinrich Gruenwald, Gomaringen; Hans Ramisch, Frankfurt, and Anton Pawlakowitsch, Alzenau, all of Fed. Rep. of Germany, assignors to Leybold Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 1, 1989, Ser. No. 444,293
Claims priority, application Fed. Rep. of Germany, Apr. 28, 1989, 3914065
Int. Cl.[5] C23F *1/02*
U.S. Cl. 156—345 **25 Claims**



1. An apparatus for plasma etching of a substrate comprising:

a process chamber wherein said substrate is etched, said process chamber having a gas conducting connection for receiving a process gas therein from an outside source, said process chamber comprising an enclosure having a bottom plate with a central etching window therethrough;

a first electrode, facing the interior of said chamber for facing a first face of said substrate;

a second electrode facing the interior of said chamber for facing a second face of said substrate, said second electrode maintained at an electric potential different from said first electrode, said second electrode in heat transfer with an external source, said second electrode positioned so as to support said substrate against said bottom plate, and provide a central etching area of said substrate exposed to an interior of said chamber through said central etching window of said bottom plate; and

the weight of said process chamber being such so as to press said bottom place down upon a continuous periphery of said substrate, and press said substrate against said second electrode.

5,009,739

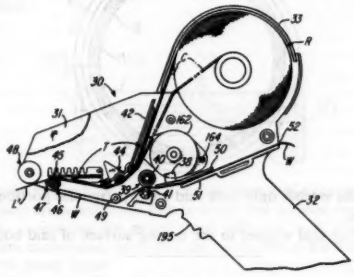
HAND-HELD LABELER

Brent E. Goodwin, Middletown; Donald L. Karn, Springboro, and John D. Mistyurik, Tipp City, all of Ohio, assignors to Monarch Marking Systems, Inc., Dayton, Ohio

Continuation of Ser. No. 209,759, Jun. 22, 1988, Pat. No. 4,956,045. This application Apr. 10, 1990, Ser. No. 507,077
Int. Cl.[5] B65C *11/02*
U.S. Cl. 156—384 **9 Claims**

1. A hand-held labeler for printing and applying labels releasably secured to a carrier web of a composite label web, comprising: a housing having a handle, means on the housing for supporting a supply roll of a composite label web, a thermal print head, a platen roll cooperable with the print head for effecting printing on the labels, means for providing a path for the composite label web from the supply roll to between the print head and the platen roll, means for delaminating printed labels from the carrier web, means for applying printed labels, means for advancing the carrier web to effect delamination of a printed label and to advance the printed label into label applying relationship with the label applying means, means for

applying braking force to the platen roll to prevent movement of the carrier web except essentially when the carrier web is being advance by the advancing means, wherein the means for providing a path includes two rollers, the rollers being arranged to contact and guide the advancing composite label



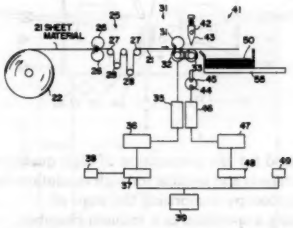
web between the supply roll and the platen roll, and a wiper disposed in a space between the rollers and projecting through a flat plane between the peripheries of the rollers so that the labels wipe against the wiper during the advance of the composite label web.

5,009,740

BAG MAKING MACHINE

Takeo Yanai, Koshiga Ya-C, Japan, assignor to Nippon Flute Co., Ltd., Irumagun, Japan

Filed Aug. 9, 1989, Ser. No. 391,259
Int. Cl.[5] B32B *31/00*; B26D *5/20*
U.S. Cl. 156—353 **8 Claims**



1. A bag making machine operable to produce thermoplastic resin film bags, said bag making machine comprising:

feed means for intermittently advancing a flat tubular web of thermoplastic resin film to be formed into a thermoplastic bag, said feed means including,

a feed roller positioned below and extending transversely across the tubular web of thermoplastic resin film such that rotation of said feed roller advances the tubular web,

a pressure roller positioned above said feed roller and mutually extending transversely across the tubular web of thermoplastic resin film so that when the tubular web lies therebetween, said pressure roller passively rotates with said feed roller to advance the tubular web;

sealing means for applying heat to and transversely sealing together two opposing layers of a tubular web of thermoplastic resin film, said sealing means including,

at least one lower surface positioned beneath and extending transversely across an intended path of travel of a tubular web of thermoplastic resin film,

at least one upper seal bar positioned above, mutually opposite to and in vertical alignment with said lower surface, wherein a tubular web of thermoplastic resin film may be operably fed between and subsequently come into contact with said at least one upper seal bar and said lower surface of said bag making machine,

means for heating said upper seal bar to thereby induce a sealing weld bead to be formed transversely across a tubular web of thermoplastic resin film when said upper seal bar is lowered into a posture juxtaposed to but spaced from said lower stationary surface with a tubular web of thermoplastic resin film therebetween;

slitting means including a cutting edge for transversely severing a tubular web of thermoplastic resin film adjacent to and substantially parallel with a weld bead thereby dividing the tubular web of thermoplastic resin film into two portions and forming a bag of a predetermined length with a transverse seal at one end;

first drive means for controllably driving said roller means so that the tubular web of thermoplastic resin film may be advanced to a positioned suitable for sealing and slitting, said first drive means comprising a first servo motor;

second drive means for driving said sealing means and said slitting means vertically toward and away from the tubular web of thermoplastic resin film so that sealing and severing may occur, said second drive means comprising a second servo motor;

control means for controlling the operation and interaction of the components of said bag making machine so that machine operation may be optimized, said control means including,

a first servo driver operable to control actuation of said first servo motor,

a second servo driver operable to control actuation of said second servo motor,

a first digital pack connected to said first servo driver which drives said first servo motor via said first servo driver,

a second digital pack connected to said second servo driver which drives said second servo motor via said second servo driver,

a sequencer connected to both said first digital pack and said second digital pack for controlling the operation of said first and said second servo motors so that when the tubular web of thermoplastic resin film is being advanced to a position suitable for the sealing and severing operation, said sealing and said cutting means are withdrawn from a position adjacent the web, and when the feed means ceases advancement of the tubular web of thermoplastic resin film, the sealing and severing operations commence,

digital dimension setting means connected to said first digital pack for operably permitting variable user control of a desired length of a bag made from the flat web of thermoplastic resin film by controlling the length of the web advanced by said feed means,

said timer being connected to both said second digital pack and said sequencer to control the amount of time said sealing means is engaged with said lower stationary surface, the time being a function of the thickness of the tubular web of thermoplastic resin film, so that a weld bead will be effected thereon and further the speed of web advance may be maintained,

a first proximity switch for detecting an upper stop position of said sealing means and producing a signal which actuates said second servo motor so that the tubular web of thermoplastic resin film may be advanced to a position suitable for sealing and slitting while said sealing means are vertically recessed from the tubular web of thermoplastic resin film, and

a second proximity switch for detecting a lower stop position of said sealing means and producing a start signal to said timer such that said sealing means will be juxtaposed with said tubular web of thermoplastic resin film the amount of time as controlled by said timer.

5,009,741

METHOD AND DEVICE FOR THE APPLICATION OF REVENUE STAMPS TO PACKS

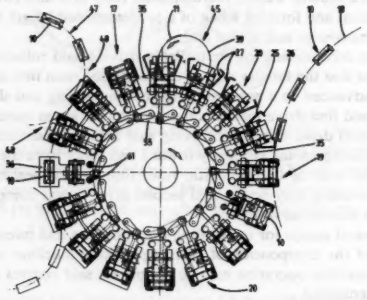
Heinz Focke, Verden, and Hans-Jürgen Bretthauer, Bremen, both of Fed. Rep. of Germany, assignors to Focke & Co. (GmbH & Co.), Verden, Fed. Rep. of Germany

Filed Oct. 12, 1989, Ser. No. 420,489

Claims priority, application Fed. Rep. of Germany, Oct. 15, 1988, 3835290

Int. Cl.[5] B65C *3/00*

U.S. Cl. 156—483 7 Claims



1. A mechanism for individually applying labels, such as revenue stamps, to faces of rectangularly shaped packs, said labels extending onto adjoining faces of the packs, comprising:

an endless label conveyor, provided with multiple pack transport sections, for continuously conveying said packs between processing stations of said mechanism, wherein said label conveyor has at least one axis around which the conveyor rotates, said axis being oriented perpendicular to a direction of rotation of said conveyor, each of said transport stations comprising:

a slide for moving each corresponding pack in a direction parallel to said axis, from a pack reception point to a pack transfer point, and

a label holder, with a mouth piece, said label holder arranged to hold the label against said mouth piece, and in a plane transverse to said axis,

said slide moving said pack through the mouth piece, and through the plane of said label, thereby causing said label to contact and stick to said pack,

wherein each label is adhered to each pack as said label conveyor rotates between processing stations.

5,009,742

METHOD AND APPARATUS FOR MAKING SEALING RINGS OF THE RADIAL TYPE WITH SEALING LIP OF FLUOROPLASTIC

Michel Saxod, Bourg, 52200 Langres, and Fabrice Fougerolle, Montlandon, 52600 Chalindrey, both of France

Division of Ser. No. 311,791, Feb. 17, 1989, abandoned. This application Feb. 6, 1990, Ser. No. 475,873

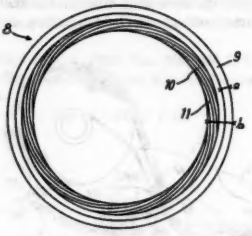
Claims priority, application France, Feb. 18, 1988, 88 01929

Int. Cl.[5] B44C *1/22;* B29C *37/00;* C03C *15/00, 25/06*

U.S. Cl. 156—633 4 Claims

1. A method of making a sealing ring of the radial type, having a reinforced elastomeric body and an annular sealing ring in the form of an annular fluoroplastic washer adhered to a mating surface on the elastomeric body, comprising steps of

subjecting only an outer peripheral portion, corresponding in size to said mating surface, of the annular ring to chemical attack, while protecting an inner peripheral portion thereof from attack, to reduce the antiadhesive properties



of the washer only over said outer peripheral portion, and then

adhering said washer to the mating surface of said body.

5,009,743

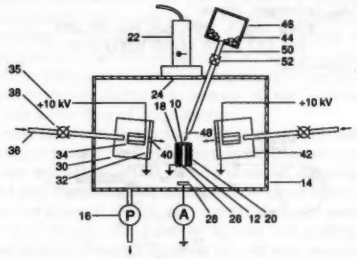
CHEMICALLY-ASSISTED ION BEAM MILLING SYSTEM FOR THE PREPARATION OF TRANSMISSION ELECTRON MICROSCOPE SPECIMENS

Peter R. Swann, Diablo, Calif., assignor to Gatan Incorporated, Pleasanton, Calif.

Filed Nov. 6, 1989, Ser. No. 431,401

Int. Cl.[5] H01L *21/306;* B44C *1/22;* C03C *15/00, 25/06*

U.S. Cl. 156—643 10 Claims



1. A method for the preparation of high quality specimens free from artefacts and suitable for high resolution transmission electron microscopy comprising the steps of:

(i) mounting a specimen in a vacuum chamber,

(ii) directing at the specimen an energetic, unfocused beam of ions neutrals, and

(iii) simultaneously directing at the specimen a separate, independent low energy molecular beam, said specimen being positioned such that the angle between the specimen surface and said energetic ion beam is between 0° and 10°, whereby said specimens may be thinned to electron transparency without the production of thinning artefacts.

5,009,744

METHOD OF MANUFACTURING LAMINATED CERAMIC ELECTRONIC COMPONENT

Harufumi Mandai; Yukio Tanaka; Shinichi Takakura, and Takuji Nakagawa, all of Kyoto, Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Feb. 15, 1989, Ser. No. 311,097

Int. Cl.[5] C23F *1/00*

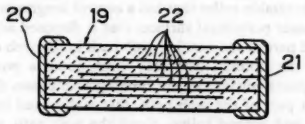
U.S. Cl. 156—656 4 Claims

1. A method of manufacturing a laminated ceramic electronic component having internal electrodes formed in a pattern, comprising the steps of:

forming a metal film on a back film by a thin film forming method;

removing part of said metal film from said back film to leave only specific parts of said metal film on said back film, said specific parts being arranged on said back film in an arrangement which corresponds to said internal electrode pattern to be formed on said ceramic green sheet; and

providing a ceramic green sheet for receiving said metal film;



transferring said metal film parts onto said ceramic green sheet from said back film to form said internal electrodes by contacting the green sheet with the back film/metal film component such that the metal film is transferred to the green sheet;

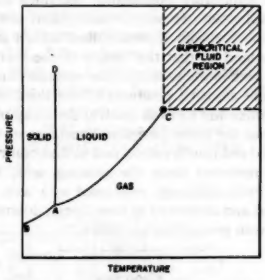
stacking a plurality of said ceramic green sheets on which respective said internal electrodes have been formed to thereby form said laminated ceramic electronic component having internal electrodes formed in a pattern.

5,009,745

METHOD FOR REMOVING POLYCHLORINATED DIBENZODIOXINS AND POLYCHLORINATED DIBENZOFURANS FROM SECONDARY FIBERS USING SUPERCRITICAL CO_2 EXTRACTION

Shafi U. Hossain, Menasha, Wis., and Carol A. Blaney, Roswell, Ga., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Oct. 12, 1990, Ser. No. 596,807
Int. Cl.[5] D21C *5/02*
U.S. Cl. 162—5 **14 Claims**



1. A method for treating cellulose-containing secondary fibers with a content of polychlorinated dibenzo-p-dioxin and-/or polychlorinated dibenzofuran comprising contacting the fibers with carbon dioxide under pressure and temperature conditions such that the carbon dioxide is a supercritical or near supercritical fluid and for a time sufficient to reduce the content of the polychlorinated dibenzo-p-dioxin and/or polychlorinated dibenzofuran.

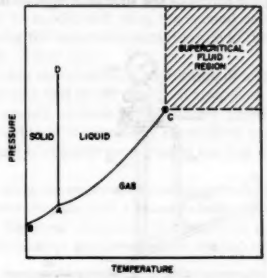
5,009,746

METHOD FOR REMOVING STICKIES FROM SECONDARY FIBERS USING SUPERCRITICAL CO_2 SOLVENT EXTRACTION

Shafi U. Hossain, Menasha, Wis., and Carol A. Blaney, Roswell, Ga., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Oct. 12, 1990, Ser. No. 596,819
Int. Cl.[5] D21C *9/08, 5/02*
U.S. Cl. 162—5 **15 Claims**

1. A method for reducing the level of sticky contaminants in cellulose-containing secondary fibers containing sticky contaminants comprising contacting the fibers with carbon dioxide under pressure and temperature conditions such that the carbon dioxide is a supercritical or near supercritical fluid and for



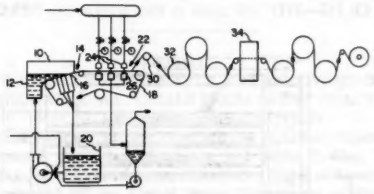
a period of time sufficient to reduce the level of sticky contaminants associated with the fibers.

5,009,747

WATER ENTANGLEMENT PROCESS AND PRODUCT

Helen Viazmensky, South Windsor; Carl E. Richard, Enfield, and James E. Williamson, Suffield, all of Conn., assignors to The Dexter Corporation, Windsor Locks, Conn.

Filed Jun. 30, 1989, Ser. No. 374,482
Int. Cl.[5] D21H *27/02*
U.S. Cl. 162—115 **16 Claims**



1. A method of producing a fiber entangled nonwoven web material comprising the steps of forming a dilute homogeneous fiber furnish of papermaking fibers and more than about 30 percent by weight of long synthetic fibers suited for being dispersed in an aqueous media; depositing the fibers from the furnish on a paper forming wire at the wet end of a paper-making machine to provide a fluidized homogeneously dispersed fibrous base web material having a liquid content of about 75% by weight or more; subjecting the fibrous base web having said liquid content to direct impingement of a series of entangling liquid jets to provide a total energy input of up to about 0.2 hp-hr/lb web to very lightly entangle the fibers in said base web; drying the entangled web and treating the web with a binder in an amount sufficient to provide a binder pickup of less than about 20% by weight based on the weight of the treated material.

5,009,748

PROCESS AND SYSTEM FOR CONTROLLING THE BASIS WEIGHT OF A SHEET MATERIAL

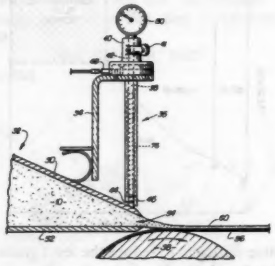
Ramesh Balakrishnan, Stanford, and Mathew G. Boissevain, Los Altos, both of Calif., assignors to Measurex Corporation, Cupertino, Calif.

Filed May 23, 1988, Ser. No. 197,752
Int. Cl.[5] D21F *11/00*
U.S. Cl. 162—198 **5 Claims**

1. A process for controlling the shape of a slice lip of a paper making machine headbox used in the production of a paper sheet, comprising the steps of:

measuring the force of a plurality of slice rods against the slice lip at a plurality of locations along the span of the slice lip across the sheet;

computing the forces of the slice rods against the slice lip at



each location which are required to achieve a desired sheet basis weight profile;

adjusting the forces of the slice rods against the slice lip so that the measured forces substantially equal the computer forces.

5,009,749

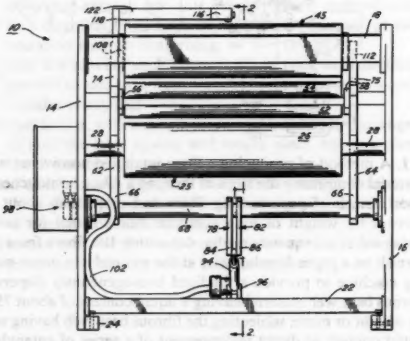
WEB DECURLER

Roger Cederholm, Roscoe, Ill., and Christopher J. Plude, Beloit, Wis., assignors to Martin Automatic, Inc., Rockford, Ill.

Filed Aug. 9, 1990, Ser. No. 564,855

Int. Cl.[5] B65H *23/34*

U.S. Cl. 162—271 **18 Claims**



1. An improved web decurler for selectively removing different degrees of curl from a running web, while maintaining web registration, as the running web passes along a web path that is defined in and through the web decurler, with the running web coming to the web decurler from a first webprocessing operation that is located upstream of the web decurler and proceeding from the web decurler to a second web-processing operation that is located downstream from the web decurler and that requires, for proper operation, web registration to exist between the second web processing operation and the running web upstream of the web decurler, the improved web decurler comprising:

a first roller assembly having a first, relatively large diameter, rotatable roller that has a central longitudinal axis and an outer peripheral surface, that is disposed adjacent to a first part of the web path in the web decurler so that the running web may wrap about a portion of its peripheral surface as the running web passes through the first part of the web path, and whose central longitudinal axis is fixed, relative to the web decurler;

a second roller assembly having a second, relatively large diameter, rotatable roller that has a central longitudinal axis and an outer peripheral surface, that is disposed adjacent to a second part of the web path in the web decurler so that the running web may wrap about a portion of its peripheral surface as the running web passes through the second part of the web path, and whose central longitudinal axis is fixed relative to the web decurler;

a third roller assembly having a third, relatively large diameter, rotatable roller that has a central longitudinal axis and an outer peripheral surface, that is disposed adjacent to a third part of the running web path in the web decurler so that the running web may wrap about a portion of its peripheral surface as the running web passes through the third part of the web path, that is disposed between the first and second rollers along the web path, and having means for maintaining the central longitudinal axis of said third roller a fixed predetermined distance from the central longitudinal axis of one of the first and second roller and means for moving said third roller about the central longitudinal axis of said one roller;

a fourth roller assembly having a fourth, relatively small diameter, rotatable roller that has a central longitudinal axis and an outer peripheral surface, that is disposed adjacent to a fourth part of the web path so that the running web may pass about a portion of its peripheral surface as the running web passes through the fourth part of the web path, that is disposed between the third roller and the other of the first and second rollers along the web path, and whose central longitudinal axis is spaced from and movable about a preselected axis which, in turn, is spaced from the central longitudinal axes of the first, second and third rollers;

means for supporting the first, second, third and fourth roller assemblies so that the first, second, third and fourth rollers may rotate about their respective central longitudinal axes; and

means for adjustably positioning the third roller and the fourth roller with respect to each other, to the web path, and to the first and second rollers which are structured and arranged so that the length of the web path of the running web in the web decurler remains constant regardless of the adjusted positions of the third roller and the fourth roller and so as to control the wrap of the running web about the outer peripheral surfaces of the first, second, third and fourth rollers and to thus control the degree of curl removed from the running web, whereby the running web, although processed as a web, will lie flat, when cut and delivered as free sheets, downstream of the second web processing operation.

5,009,750

PROCESS AND APPARATUS FOR THE MANUFACTURE OF A METAL FOIL

Emil Hula, Giesshübl, and Gerald Maresch, Mödling, both of Austria, assignors to Maschinenfabrik Andritz Actiengesellschaft, Graz-Andritz, Austria

Filed Nov. 15, 1989, Ser. No. 436,638

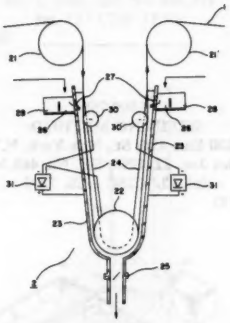
Claims priority, application Austria, Nov. 15, 1988, 2801/88; Sep. 28, 1989, 2263/89

Int. Cl.[5] C25D *1/04*

U.S. Cl. 204—13 **9 Claims**

1. A process for the manufacture of a metal foil by deposition of an electrolyte on an endless carrier belt, said process including the steps of: providing at least one vertically extending wall defining a vertically extending anode element, providing the belt with an upper deflecting roll adjacent an upper portion of said wall and a lower deflecting roll adjacent a lower portion of said wall, said rolls being positioned to provide a vertically extending run of the belt adjacent the anode element, said run of the belt and the anode element defining therebetween a vertically extending passage for electrolyte, providing lateral sealing elements to enclose said passage,

providing a flow becalming vessel for electrolyte adjacent an upper end of said wall, said vessel having an overflow leading into an upper end of said passage, providing an adjustable cross-section drainage aperture at a lower end of said wall for draining electrolyte from said passage, supplying electrolyte to



said passage from said vessel, adjusting the cross-sectional area of said drainage aperture to control the electrolyte flow through said passage, causing the belt to traverse said run, and providing electric current flow between the anode element and said run of the belt at a varying current density along the length of said run to deposit metal on the belt and form a foil.

5,009,751

PROCESS FOR SEPARATION OF HAFNIUM TETRACHLORIDE FROM ZIRCONIUM TETRACHLORIDE

Tomoo Kirihara; Ippei Nakagawa, both of Aichi; Yoshinobu Seki, Tokai; Yutaka Honda, Saraki, and Yasuo Ichihara, Saraki, all of Japan, assignors to Mitsubishi Nuclear Fuel Company, Ltd., Tokyo, Japan

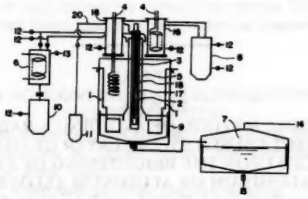
Filed Jan. 5, 1989, Ser. No. 293,791

Claims priority, application Japan, Jan. 12, 1988, 63-4416

The portion of the term of this patent subsequent to May 15, 2007, has been disclaimed.

Int. Cl.[5] C01G *25/04, 27/04;* C25B *1/00*

U.S. Cl. 204—61 **6 Claims**



1. A process for a separation of hafnium tetrachloride from zirconium tetrachloride comprising the following steps of:

(a) introducing zirconium tetrachloride containing about 2–4 wt % of hafnium tetrachloride into an electrolytic cell equipped with a pair of first and second cathodes, and a third electrode and filled with a molten salt;

(b) dissolving the zirconium tetrachloride of step (a) in the molten salt of step (a) to make an electrolytic bath;

(c) running a first phase electrolysis, i.e. electrolytic reduction of the dissolved zirconium tetrachloride under maintenance of an initial concentration of the zirconium tetrachloride by supplying zirconium tetrachloride of step (a) to the electrolytic bath;

(d) producing zirconium trichloride containing a lower hafnium content than that of the dissolved zirconium tetrachloride of steps (b) and (c) at a first cathode;

(e) running a second phase electrolysis using the pair of first and second cathodes, but switching the first cathode to become an anode, and using the second cathode;

(f) supplying the zirconium tetrachloride to the second cathode side of step (e);

(g) producing the zirconium trichloride of a lower hafnium content than that of the dissolved zirconium tetrachloride at the second cathode and evolving gaseous zirconium tetrachloride at the anode by electrolytic oxidation of the zirconium trichloride produced in the first phase electrolysis;

(h) recovering the evolved zirconium tetrachloride as zirconium tetrachloride with a lower hafnium content than that of the dissolved zirconium tetrachloride and the zirconium trichloride produced at the second cathode in step (g);

(i) subsequently continuing the second phase electrolysis as set forth in steps (e), (f), (g) and (h) by changing over polarities of the second cathode and the anode, when a concentration of zirconium trichloride at the anode decreases;

(j) ceasing the supply of zirconium tetrachloride of step (f) when the vapor pressure value of hafnium tetrachloride, which has become concentrated in the electrolytic bath reaches about 1/10 of that of the dissolved zirconium tetrachloride, and continuing the second phase electrolysis until most of the zirconium trichloride produced at the second cathode is oxidized and evolved;

(k) transferring the electrolytic bath to a separate vessel; and

(l) separating the concentrated hafnium tetrachloride from the molten salt by raising the temperature of the transferred electrolytic bath to about 850° C.

5,009,752

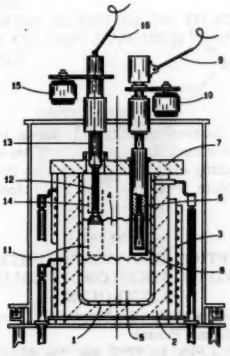
PROCESS AND APPARATUS FOR RECOVERY OF FISSIONABLE MATERIALS FROM SPENT REACTOR FUEL BY ANODIC DISSOLUTION

Zygmunt Tomczuk, Orland Park; William E. Miller, Naperville; Raymond D. Wolson, Lockport, and Eddie C. Gay, Park Forest, all of Ill., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 25, 1989, Ser. No. 398,578

Int. Cl.[5] C25C *3/00*

U.S. Cl. 204—64 R **15 Claims**



1. A process for separating uranium and plutonium from chopped spent metal-clad fuel pins comprising the steps of:

providing an electrolyte cell having a cadmium pool, an electrolyte pool, an improved anode basket assembly, cathode means, means for flushing said improved anode

basket assembly, and means for providing electrical power to said improved anode basket assembly and wherein said improved anode basket assembly comprises a metal shaft having a top end and a bottom end, said top end connected to means for rotation capable of imparting rotation to said shaft, a plurality of perforated metal boxes having means for attaching said plurality of perforated metal boxes around the periphery of the bottom end of said shaft and extending radially outward therefrom, means for lowering and raising said metal boxes into said electrolyte pool and means for carrying an electric current from said electrical power means to said plurality of perforated metal boxes;

loading chopped spent fuel pins having a metal cladding comprising an alloy of uranium and plutonium into said improved anode basket assembly until said chopped spent fuel pins form a tightly packet configuration;

lowering said improved anode basket assembly containing said chopped spent fuel pins to a first position in said electrolyte pool;

providing an electric current from said electrical power means to said improved anode basket assembly and said cathode means at a voltage sufficient to form uranium cations and plutonium cations, and by creating a flushing action of said electrolyte pool through said chopped spent fuel pins by using said means for flushing;

raising said improved anode basket assembly out of said electrolyte pool to a second position and creating a drying action to remove any of said electrolyte pool by using said means for flushing; and

recovering said metal cladding from said improved anode basket assembly.

5,009,753

PREPARATION OF DIHYDROXYDIONES

Dieter Hermeling, Neustadt; Rainer Becker, Bad Durkheim, and Walter Dobler, Heidelberg, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

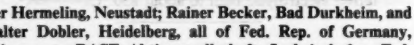
Filed Oct. 18, 1989, Ser. No. 423,224

Claims priority, application Fed. Rep. of Germany, Nov. 9, 1988, 3837954

Int. Cl.[5] C25B *3/00*

U.S. Cl. 204—75 **8 Claims**

1. A process for the preparation of a dihydroxydione of the formula



I

where R is alkyl, which comprises:

subjecting an aldehyde of the formula

II

where R has the abovementioned meaning, to electrolysis in a water-containing electrolyte which has a pH of about 4 to 5 while using a cathode selected from the group consisting of graphite, lead, iron, nickel and steel.

5,009,754

CONSUMPTION OF HYPOCHLORITE VALUES CONTAINED IN PERCHLORATE SOLUTIONS OF ELECTROLYSIS

Christian Pralus, Saint-Cyr-Au-Mont-d'Or, France, assignor to Atochem, Puteaux, France

Filed Feb. 22, 1990, Ser. No. 482,920

Claims priority, application France, Feb. 22, 1989, 89 02536

Int. Cl.[5] C25B *1/28*

U.S. Cl. 204—82 **6 Claims**

1. A process for the consumption of the hypochlorite values, ClO^- ions, contained in a solution of an alkali metal perchlorate produced by electrolysis of an aqueous solution of a chlorate of said alkali metal, without adversely affecting the valence state of hexavalent chromium values also contained therein, comprising intimately contacting such perchlorate solution with an effective amount of hydrogen peroxide such that the molar ratio of available hydrogen peroxide/hypochlorites is at least one.

5,009,755

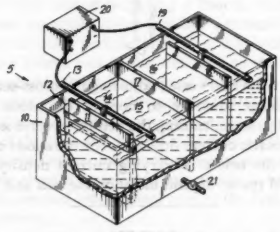
REFINING METHOD

Peter S. Shor, 230 East 15th St., New York, N.Y. 10003

Filed Jan. 22, 1990, Ser. No. 468,369

Int. Cl.[5] C25C *1/20, 7/00*

U.S. Cl. 204—111 **9 Claims**



1. In a halide-electrolyte for electrolyzing gold-containing anodes for gold recovery, wherein said electrolyte consists essentially of an aqueous halide-ion source containing initially an impregnating agent for modifying the electropotential of the metallic gold upon application of electrolysis current and forming a pregnant electrolyte for continuously electrolyzing and dissolving the gold, said impregnating agent being a nascent oxygen source present by volume in said electrolyte in an amount of at least one part per million; the improvement wherein said halide ion source as electrolyte is essentially an aqueous solution of ammonium chloride, to provide sufficient ammonium ions to complex with and to form electrolyte-soluble silver and copper ammonium complexes with any silver and/or copper in said anodes.

5,009,756

CHEMICAL METHOD OF AVOIDING A RAINBOW EFFECT CAUSED BY THE LAYER OF OXIDE PRODUCED UPON THE BRIGHTENING OF PARTS OF ALUMINUM OR ALUMINUM ALLOYS

Klaus-Dieter Bartkowski, Krefeld, and Peter Venn, Wuppertal, both of Fed. Rep. of Germany, assignors to Gebr. Happich GmbH, Fed. Rep. of Germany

Filed May 23, 1990, Ser. No. 527,587

Claims priority, application Fed. Rep. of Germany, May 26, 1989, 3917186

Int. Cl.[5] C25D *11/24; C25F 3/20*

U.S. Cl. 204—129.35 **3 Claims**

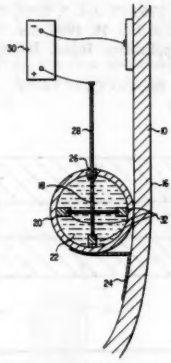
1. A method for avoiding a rainbow effect which is caused by the layer of oxide produced in the electrolytic-alkaline brightening of aluminum or aluminum alloy parts, comprising, after said brightening, subjecting said parts to a further treatment in which the parts are first washed in water and then exposed in a chromic acid solution and finally washed in a sodium hydrosulfite solution.

5,009,757

ELECTROCHEMICAL SYSTEM FOR THE PREVENTION OF FOULING ON STEEL STRUCTURES IN SEAWATER

William J. Riffe, and Jack D. Carter, Jr., both of Morehead City, N.C., assignors to Marine Environmental Research, Inc., Morehead City, N.C.

Continuation of Ser. No. 145,275, Jan. 19, 1988. This application Jul. 5, 1990, Ser. No. 548,214
Int. Cl.[5] C23F *13/00*
U.S. Cl. 204—147 22 Claims



1. A system for preventing fouling or corrosion of a surface or surfaces of a marine structure in contact with a water environment, said marine structure having an interior surface and an exterior surface, said system comprising:

(a) a conductive zinc coating in conductive contact with at least part of said exterior surface, wherein when said marine structure is in contact with said water environment, said conductive zinc coating forms an interfacial layer between said exterior surface and said water environment; and

(b) means for inducing and maintaining a negative capacitive charge on said conductive zinc coating sufficient to prevent fouling or corrosion of said exterior surface when said exterior surface is in contact with said water environment, said means comprising a power supply having a terminal of a first polarity conductively connected to said exterior surface and a terminal of opposite polarity capacitively connected to said exterior surface, said power supply and said capacitive connection means being both protected from contact by said water environment.

5,009,758

CLOSED NONCONTINUOUS ELECTRODEPOSITION PAINTING SYSTEM

Kenji Okada, Riverview, and Hiroshi Ueno, Grosse Ile, both of Mich., assignors to Mazda Motor Manufacturing (USA) Corp., Flat Rock, Mich.

Filed Aug. 16, 1988, Ser. No. 233,180
Int. Cl.[5] G25D *13/24;* B05C *11/10*
U.S. Cl. 204—180.8 24 Claims

18. A closed, noncontinuous process for separating and filtering paint into paint rich and solvent rich components by using paint holding means, solvent holding means and filtration means, said process comprising the steps of:

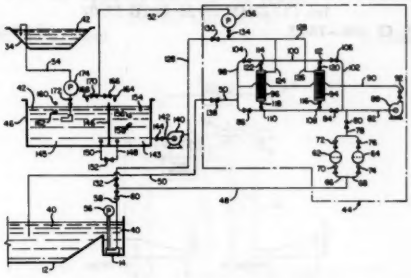
(a) sensing a first level of solvent in said solvent holding means and conveying paint from said paint holding means to said filtration means and filtering said paint to separate it into paint rich and solvent rich components;

(b) conveying said paint rich components to said paint holding means and conveying said solvent rich components to said solvent holding means;

(c) sensing a second level of solvent in said solvent holding means higher than said first level of solvent and stopping the flow of paint through said filtration means and conveying solvent from said solvent holding means to said filtration means, through said filtration mean sand to said paint holding means;

(d) sensing a third level of solvent in said solvent holding means lower than said second level of solvent and stopping the flow of solvent from said solvent holding means to said filtration means and from said filtration means to said paint holding means;

(e) sensing a fourth level of solvent in said solvent holding mean slower than said second level of solvent and higher than said third level of solvent and reversing the flow of



solvent through said filtration means and conveying said solvent through said filtration means and to said paint holding means; and

(f) sensing a fifth level of solvent in said solvent holding means lower than said fourth level of solvent and higher than said third level of solvent and stopping the flow of solvent from said filtration means to said paint holding means;

wherein steps (a)–(f) are performed in response to signals generated from sensors located in said solvent holding means which sense the level of solvent in said solvent holding means wherein steps (e) and (f) are performed prior to step (d).

5,009,759

METHODS FOR PRODUCING AGAROSE GELS HAVING VARIABLE PORE SIZES

Philip Serwer, and Gary A. Griess, both of San Antonio, Tex., assignors to Board of Regents, The University of Texas System, Austin, Tex.

Filed Sep. 22, 1989, Ser. No. 411,373
Int. Cl.[5] G01N *27/26;* B01D *57/02*
U.S. Cl. 204—182.8 59 Claims

1. A method for controlling the pore size of an agarose gel, the method including the steps of:

(a) preparing an aqueous solution of agarose; and

(b) adding said aqueous solution of agarose to a mold with a concentration gradient of at least one of a salt or buffer; and

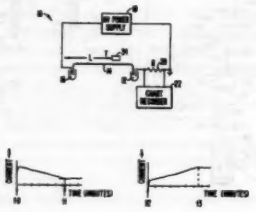
(c) gelling the agarose, said concentration gradient determining pore size of subsequently gelled agarose.

5,009,760

SYSTEM FOR MEASURING ELECTROKINETIC PROPERTIES AND FOR CHARACTERIZING ELECTROKINETIC SEPARATIONS BY MONITORING CURRENT IN ELECTROPHORESIS

Richard N. Zare, Stanford; Xiaohua Huang, Mountain View, and Jack I. Ohms, Palo Alto, all of Calif., assignors to Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

Continuation-in-part of Ser. No. 386,991, Jul. 28, 1989, abandoned. This application Dec. 29, 1989, Ser. No. 456,594
Int. Cl.[5] G01N *27/26;* B01D *57/02*
U.S. Cl. 204—183.3 13 Claims



1. A method for determining the electrokinetic properties of an electrolyte in an electrokinetic separation by means of an elongated capillary tube having an inlet end and an outlet end, said method comprising:

introducing a first electrolyte into the tube at its inlet end;

introducing a second electrolyte into the capillary tube at its inlet end, wherein said second electrolyte has an electrical resistivity which differs from that of the first electrolyte but substantially the same chemical properties as the first electrolyte;

applying a voltage to and current through the electrolyte to cause electroosmotic flow of the electrolytes towards the outlet end and to cause the second electrolyte to replace the first electrolyte continuously;

measuring the current through the electrolytes as a function of time; and

determining the electroosmotic velocity of the first or second electrolyte.

5,009,761

METHOD OF PRODUCING AN OPTICAL COMPONENT, AND COMPONENTS FORMED THEREBY

Dennis W. Robinson, Bradford on Avon, England, assignor to Spafax Holdings Plc., United Kingdom

Filed Sep. 24, 1984, Ser. No. 654,210
Int. Cl.[5] C23C *14/34*
U.S. Cl. 204—192.14 14 Claims

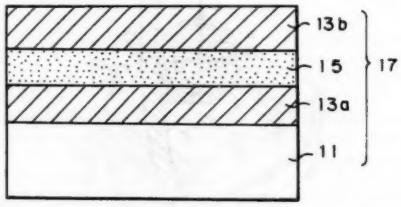
1. A method of making an optical component having an abrasion resistant specular reflective finish on a plastics material comprising subjecting the plastics material to a degreasing operation by vapor degreasing in a fluorocarbon solvent and then transferring the plastics material to an ultrasonically vibrated heated solution of the same solvent, performing a molecular cleaning operation on the plastics material, applying a layer to the plastics material, said layer comprising a material selected from the group consisting of glass and metal oxides of the metal to be used as the specular reflective material, said layer being applied in a vacuum vessel in an atmosphere of oxygen and argon, and being applied to a thickness of between about 0.5 and about 1.0 microns, and subsequently applying a coating of specular reflective material to the layer, said coating being between about 0.5 and about 5.0 microns thick thereby producing said abrasion resistant specular reflective finish on said plastics material.

5,009,762

MAGNETO-OPTICAL RECORDING MEDIUM HAVING PROTECTIVE FILM WITH INCREASED KERR EFFECT AND IMPROVED PROTECTION CHARACTERISTIC AND MANUFACTURING METHOD OF THE SAME

Yoshinori Maeno; Masanobu Kobayashi, and Kayoko Oishi, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Division of Ser. No. 376,591, Jul. 7, 1989, Pat. No. 4,950,947.
This application Jan. 18, 1990, Ser. No. 466,947
Claims priority, application Japan, Jul. 8, 1988, 63-170567; Mar. 2, 1989, 1-50467
Int. Cl.[5] C23C *14/34*
U.S. Cl. 204—192.16 5 Claims



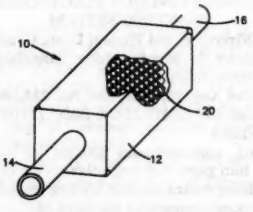
1. In a method of manufacturing a magneto-optical recording medium including at least one protective film and a magnetic film respectively formed on a substrate by depositing said films on said substrate, the improvement wherein said protective film is deposited by simultaneously sputtering onto said substrate a protective film formed from a film forming target including at least one compound selected from the group consisting of strontium titanate ($SrTiO_3$) or barium titanate ($BaTiO_3$) and a composition adjusting target constituted with titanium (Ti) or titanium oxide (TiO_y), where y is a positive number.

5,009,763

HONEYCOMB SOLID OXIDE ELECTROLYTIC CELL ASSEMBLY AND METHOD

Ralph E. Hise, Shaker Heights, Ohio, assignor to Advanced Technologies Management, Inc., Shaker Heights, Ohio

Filed Apr. 24, 1989, Ser. No. 341,869
Int. Cl.[5] C25B *9/00, 15/08, 11/03, 11/04*
U.S. Cl. 204—255 20 Claims



1. An apparatus for the reduction and oxidation of constituents of a fluid, said apparatus comprising:

an ion conducting ceramic structure;

a passage extending through said structure;

a first porous electrode at least partially lining the passage; and

a second and a third porous electrode on the structure external to the passage, said second and third electrodes being oppositely disposed about the first electrode and being

adapted for the application of an electrical potential difference between said second and third electrodes, whereby reduction and oxidation reactions may be made to occur concurrently about the first porous electrode.

5,009,764

APPARATUS FOR REMOVAL OF ELECTRICAL SHORTS IN A SPUTTERING SYSTEM

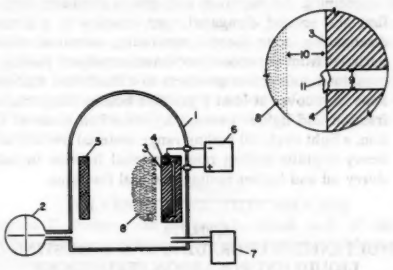
Jerry D. Siefkes, Fort Collins; John G. Harpold, Bellvue, and Douglas S. Schatz, Fort Collins, all of Colo., assignors to Advanced Energy Industries, Inc., Fort Collins, Colo.

Continuation of Ser. No. 297,707, Jan. 13, 1989. This application Mar. 16, 1990, Ser. No. 494,554

The portion of the term of this patent subsequent to Jun. 26, 2007, has been disclaimed.

Int. Cl.[5] C23C *14/54*

U.S. Cl. 204—298.08 20 Claims



1. An apparatus for removing an electrical short caused by a flake in a sputtering system having a power supply comprising:

a. a sensor for detecting the presence of an electrical short caused by a flake across said power supply; and

b. a means for automatically removing said flake by manipulating said power supply in a manner which melts said flake.

5,009,765

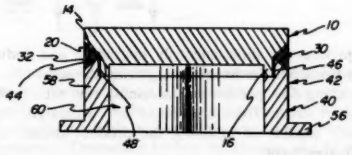
SPUTTER TARGET DESIGN

Sohail S. Qamar, Hilliard; Harry W. Conard, and Lowell E. Hamilton, both of Orient, all of Ohio, assignors to Tosoh SMD, Inc., Grove City, Ohio

Filed May 17, 1990, Ser. No. 525,361

Int. Cl.[5] C23C *14/34*

U.S. Cl. 204—298.12 20 Claims



1. A sputter target assembly of the type wherein a cooling medium is to be provided in heat exchange relation with said target, comprising:

a sputter target having an upper surface carrying the material to be sputtered, an outer, peripheral surface and a cooling surface;

backing means comprising an upper mounting section positioned adjacent to the sputter target and having an outer peripheral surface, wherein the backing means and the target cooling surface, together, define a chamber adapted for reception of the cooling medium with the peripheral surfaces of the target member and the backing means nested adjacent each other to define an interface,

recess means formed at the interface of the sputter target and the backing means along adjacent peripheral surfaces of the sputter target and the backing means, and

metal bonding means disposed in the recess means for fixedly retaining the backing means and the sputter target together.

5,009,766

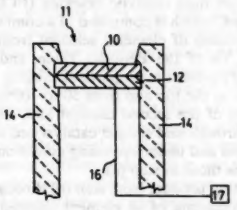
METAL OXIDE ELECTRODES

Imants R. Lauks, Morrisville, Pa., assignor to I-Stat Corporation, Princeton, N.J.

Continuation of Ser. No. 153,189, Feb. 8, 1988, which is a continuation of Ser. No. 390,445, Aug. 2, 1988, which is a continuation of Ser. No. 489,851, Mar. 2, 1990. This application Oct. 30, 1990, Ser. No. 608,601

Int. Cl.[5] G01N *27/46*

U.S. Cl. 204—419 20 Claims



1. A metal oxide electrode sensitive to hydrogen ions comprising:

a mixture of at least one insulating material having a density of binding sites sufficiently large to be sensitive to hydrogen ions, and at least one conductive metal oxide selected from the Group VIIIB metal oxides,

wherein the size of the particles of conductive metal oxide in said mixture is sufficiently small as to not exhibit bulk conductive properties, thereby reducing the susceptibility of said mixture to redox interference, while the molar ratio of said conductive metal oxide to said insulating material is sufficiently large than the resistivity of said mixture is in the range of 10^{10} to 10^{14} ohm-cm, whereby the electrode, as a whole, has sufficient conductivity to operate in a Faradaic configuration.

5,009,767

RECYCLE OF OILY REFINERY WASTES

Mark P. Bartilucci, S. Melbourne, Australia; Grant G. Karsner, Voorhees Township, and William J. Tracy, III, Sewell, both of N.J., assignors to Mobil Oil Corporation, Fairfax, Va.

Continuation-in-part of Ser. No. 151,380, Feb. 2, 1988, Pat. No. 4,874,505. This application Sep. 21, 1989, Ser. No. 410,434

The portion of the term of this patent subsequent to Oct. 17, 2006, has been disclaimed.

Int. Cl.[5] C10G *55/04*

U.S. Cl. 208—85 24 Claims

1. A process for disposing of petroleum containing sludge comprising:

(i) segregating waste oil-containing sludges into a first sludge and a second sludge, the first sludge being of high oil content relative to the second sludge and the second sludge being of high water content relative to the first sludge;

(ii) dewatering the first, high oil content sludge;

(iii) introducing the dewatered sludge into a delayed coking drum under delayed coking conditions in the presence of a liquid coker hydrocarbon feedstock to form coke;

(iv) introducing the second, high water content sludge into a delayed coking drum to quench the coke formed in the coking drum.

5,009,768

HYDROCRACKING HIGH RESIDUAL CONTAINED IN VACUUM GAS OIL

Roberto Galiasso; Alfredo Morales, and Jose A. Salazar, all of Caracas, Venezuela, assignors to Intevep, S.A., Caracas, Venezuela

Filed Dec. 19, 1989, Ser. No. 452,389
Int. Cl.[5] C10G *69/04*
U.S. Cl. 208—89 20 Claims

1. A hydrocatalytic process for producing diesel and gasoline from high-residual vacuum gas oil, which comprises:

(a) contacting high-residual vacuum gas oil feedstock with a fixed bed hydrodemetallization (HDM) catalyst composed of elements selected from Groups VIb and VIII of the Periodic Table in the presence of hydrogen and under moderate operating conditions to achieve at least 80% by weight of metal removal;

(b) conveying product from step (a) together with light cycle oil (LCO), heavy cycle oil (HCO) or a mixture thereof from fluid catalytic cracking (FCC) to a second catalyst bed, which is composed of a combination of catalysts, consisting of elements selected from Groups VIb, VIII and Va of the Periodic Table, and wherein said catalysts are present in proportions ranging from 0 to 70% by volume at the top and from 30 to 100% by volume at the bottom of the second catalyst bed, and passing said product through said second catalyst bed in the presence of hydrogen and under operating conditions substantially the same as those in step (a);

(b') transmitting product from step (b) through a third catalyst bed consisting of an element selected from Groups VIb and VIII of the Periodic Table supported on a silica-alumina base, and where said catalysts are present in an amount which varies from 30 to 50% of total catalyst volume, and passing said product through the third catalyst bed in the presence of hydrogen and under substantially the same or different operating conditions from those of step (a); and

(c) separating diesel fuel and naphthas from the product from step (b) or from step (b'), recovering the diesel fuel and then subjecting the resulting product to catalytic cracking (FCC).

5,009,769

PROCESS FOR CATALYTIC CRACKING OF HYDROCARBONS

Alan R. Goelzer, Atkinson, N.H., assignor to Stone & Webster Engineering Corporation, Boston, Mass.

Continuation of Ser. No. 307,329, Feb. 6, 1989, abandoned. This application Mar. 19, 1990, Ser. No. 496,164
Int. Cl.[5] C10G *11/18, 51/06*
U.S. Cl. 208—113 5 Claims

1. In a fluidized catalytic cracking-regeneration process for cracking hydrocarbon feedstocks or the vapors thereof with a cracking catalyst consisting of separate first and second catalyst regeneration zones, wherein said catalyst is regenerated in said first and second regeneration zones, successively, by combusting hydrocarbonaceous deposits on the catalyst in the presence of an oxygen-containing gas under conditions effective to produce a first regeneration zone flue gas rich in carbons monoxide and a second regeneration zone flue gas rich in carbon dioxide, wherein temperatures in the first regeneration zone range from about 1100° F. to about 1300° F., and temperatures in the second regeneration zone range from about 1300° F. to about 1800° F., wherein the improvement consists of:

(a) cracking a first hydrocarbon feed comprising gas oil, residual oil boiling range material or mixtures thereof in a first elongated riser reactor in the presence of regenerated cracking catalyst supplied from the second catalyst regeneration zone at a temperature of at least 1300° F., a catalyst-to-oil ratio of from 5 to 10, and residence time of from 1 to 4 seconds and where coke is deposited on said catalyst in an amount less than 1.2 weight percent thereof, to obtain vaporous conversion products of the first hydrocarbon feed comprising a heavy naphtha fraction and materials lower boiling than said heavy naphtha fraction, a light cycle oil, a heavy cycle oil, and materials higher boiling than said heavy cycle oil, while simultaneously

(b) cracking a second hydrocarbon feed comprising virgin naphtha, intermediate and heavy cracked naphtha boiling range material or mixtures thereof, having a boiling point to about 450° F., in a second elongated riser reactor in the presence of regenerated cracking catalyst supplied from the second catalyst regeneration zone at a temperature of at least 1300° F., a catalyst-to-oil ratio of from 3 to 12, and residence time of from 1 to 5 seconds, and where coke is deposited on said catalyst in an amount less than 0.5 weight percent thereof, to obtain vaporous conversion products of the second hydrocarbon feed comprising gasoline boiling range material having a high aromatic content and octane number and lighter hydrocarbon material from a light cycle oil material, and

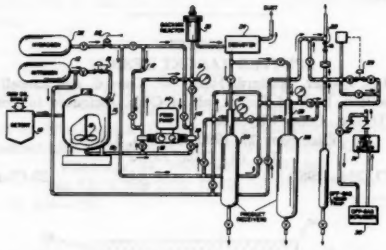
(c) combining the vaporous conversion products from the first and second elongated riser reactors in a common disengaging zone therein separating entrained catalyst particles from vaporous product material and passing the combined conversion products to a fractional distillation zone to recover at least a gasoline boiling range material fraction and lighter gaseous hydrocarbon material fraction, a light cycle oil boiling range material fraction and a heavy naphtha boiling range material fraction including slurry oil and higher boiling material fractions.

5,009,770

SIMULTANEOUS UPGRADING AND DEDUSTING OF LIQUID HYDROCARBON FEEDSTOCKS

Jeffrey T. Miller, Naperville, Ill., and Albert L. Hensley, Jr., Munster, Ind., assignors to Amoco Corporation, Chicago, Ill.

Filed Aug. 31, 1988, Ser. No. 238,929
Int. Cl.[5] C10G *13/02, 23/00*
U.S. Cl. 208—209 10 Claims



1. A process for simultaneously upgrading and dedusting liquid hydrocarbon feedstocks comprising the steps of:

(a) injecting dust particulate-containing raw retort effluent product stream from a feed line into a catalytic hydrotreater capable of agitating the product stream during hydrotreatment;

(b) agitating the product stream with a hydrotreating gas upstream of said hydrotreater to substantially prevent settling of particulate matter in the feed line;

(c) agglomerating said particulates to enhance solid-liquid separation and removing at least 90% of sulfur and nitrogen contaminants to produce synthetic crude oil by hydrotreating said product stream in the presence of a hydroprocessing catalyst at a temperature of from about 760° to about 825° F., under a hydroprocessing gas pressure of from about 1500 to about 2500 psi and at a space velocity of from about 0.1 to about 6.0 hr^{-1}; and

(d) substantially separating the agglomerated particulates from the hydrotreated oil.

5,009,771

HYDROCONVERSION PROCESS USING MIXED CATALYST SYSTEM

Frederick T. Clark, Wheaton, Ill.; Albert L. Hensley, Jr., Munster, Ind.; David Lyzinski, Wheaton, Ill., and Lawrence B. Peck, Houston, Tex., assignors to Amoco Corporation, Chicago, Ill.

Filed Mar. 30, 1990, Ser. No. 502,297
Int. Cl.[5] C10G *45/04*
U.S. Cl. 208—216 PP 16 Claims

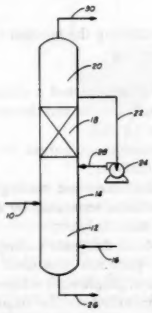
1. A process for the hydrodemetallization, hydrodesulfurization, hydrodenitrogenation, and hydroconversion of a hydrocarbon feedstock containing asphaltenes, metals, and Shell hot filtration solids precursors which comprises contacting said feedstock with hydrogen under conversion conditions in the presence of a catalyst mixture comprising a first catalyst composition comprising a porous refractory inorganic oxide wherein said first catalyst composition possesses a pore volume of less than about 0.10 cc/g in pores having a diameter greater than about 200 Angstroms, a pore volume of less than about 0.02 cc/g in pores having a diameter greater than about 800 Angstroms, and a maximum average mesopore diameter of about 130 Angstroms; and a second catalyst composition comprising a porous refractory inorganic oxide wherein said second composition possesses a pore volume of greater than about 0.07 cc/g in pores having a diameter greater than about 800 Angstroms.

5,009,772

SOLVENT EXTRACTION PROCESS

Stephen R. Nelson, and Richard L. Hood, both of Edmond, Okla., assignors to Kerr-McGee Corporation, Oklahoma City, Okla.

Filed Feb. 27, 1989, Ser. No. 315,489
Int. Cl.[5] C10C *3/08*
U.S. Cl. 208—309 8 Claims



1. A continuous solvent deasphalating process for separating a heavy hydrocarbon material feedstock containing both solvent soluble lower molecular weight hydrocarbon components and solvent insoluble higher molecular weight hydrocarbon components, Conradson carbon precursors and heavy metals comprising:

contacting said feedstock with an extraction solvent in an extraction zone, said zone containing a high pressure compartment, a pressure reduction compartment and a low pressure compartment and whereby said contact is initially effected in said high pressure compartment, to continuously form an extraction mixture comprised of said feedstock as a dispersed phase and said extraction solvent as a continuous phase, said contact being carried out in said high pressure compartment of said extraction zone in a countercurrent flow relationship at an elevated temperature ranging from about 5° C. to about 20° C. or more below said extraction solvent's critical temperature and under a superatmospheric pressure of about about the equilibrium vapor pressure of said extraction solvent at the elevated temperature employed;

maintaining said extraction mixture in said high pressure compartment of said extraction zone at said elevated temperature and under said superatmospheric pressure, whereby a first light extract phase rich in said solvent soluble lower molecular weight hydrocarbon components and a first heavy raffinate phase rich in said solvent insoluble higher molecular weight hydrocarbon components, Conradson carbon precursors and heavy metals form and separate individually from said extraction mixture within said high pressure compartment of said extraction zone;

maintaining said extraction mixture and said first heavy raffinate phase in such high pressure compartment of said extraction zone at said elevated temperature and under said superatmospheric pressures while withdrawing said first light extract phase from said high pressure compartment and introducing said first light extract phase into said pressure reduction compartment of said extraction zone;

reducing the pressure upon said first light extract phase within said pressure reduction compartment of said extraction zone, while maintaining said extract phase at said elevated temperature, by an amount sufficient to effect within said low pressure compartment of said extraction zone a separation of said first light extract phase into a second light extract phase enriched in said solvent soluble lower molecular weight hydrocarbon components and a second heavy raffinate phase rich in said solvent insoluble higher molecular weight hydrocarbon components, Conradson carbon precursors and heavy metals;

withdrawing said reduced pressure first light extract phase from said pressure reduction compartment of said extraction one and introducing said reduced pressure first light extract phase into said lower pressure compartment of said extraction zone wherein said separation is effected and recovering individually from said lower pressure compartment of said extraction zone said second light extract phase and said second heavy raffinate phase; and

repressurizing at least a portion of said second heavy raffinate phase recovered from said low pressures compartment of said extraction zone to said superatmospheric pressure being maintained upon said extraction mixture and said first light extract phase and said first heavy raffinate phase being formed within said high pressure compartment of said extraction zone and recycling said repressurized portion back to said high pressure compartment of said extraction zone to provide reflux for said first light extract phase and said extraction mixture contained therein.

5,009,773

MONITORING SURFACTANT CONTENT TO CONTROL HOT WATER PROCESS FOR TAR SAND

Laurier L. Schramm, and Russell G. Smith, both of Edmonton, Canada, assignors to Alberta Energy Company Ltd.; Canadian Occidental Petroleum Ltd.; Esso Resources Canada Limited, all of Alberta, part interest to each; Gulf Canada Limited, Ontario; Her Majesty the Queen in right of the Province of Alberta, Alberta; HBOG-Oil Sands Limited Partnership, Alberta; PanCanadian Petroleum Limited, Alberta and Petro-Canada Inc., Alberta, all of, Canada

Filed Jan. 7, 1987, Ser. No. 1,258
Int. Cl.[5] C10E *1/04*
U.S. Cl. 208—391 1 Claim

1. In the hot water process for extracting bitumen from tar sand of varying nature in an extraction circuit, said process comprising conditioning the tar sand by slurrying it with hot water and alkaline process aid and agitating it, diluting the conditioned slurry with additional hot water, and retaining the diluted slurry in a primary separation vessel to produce an underflow of solids and an overflow of primary bitumen froth, the improvement comprising:

(a) determining for the circuit involved a measure of the

critical equilibrium free carboxylate-type surfactant concentration ("C_{CS}^{o}"), in the process water, at which maximum primary froth recovery occurs;

(b) determining for the circuit involved a measure of the critical equilibrium free sulfonate-type surfactant concentration ("C_{SS}^{o}") in the process water, at which maximum primary froth recovery occurs;

(c) determining whether the diluted slurry undergoing processing is one from which recovery of primary froth is first predominantly influenced by the concentration in the process water of free carboxylate-type surfactants or free sulfonate-type surfactants;

(d) in the case where the carboxylate-type surfactants first dominate, adjusting process aid addition to the process to bring the equilibrium free carboxylate-type surfactant concentration in the process water toward C_{CS}^{o};

(e) in the case where the sulfonate-type surfactants first dominate, adjusting process aid addition to the process to bring the equilibrium free sulfonate-type surfactant concentration in the process water toward C_{SS}^{o};

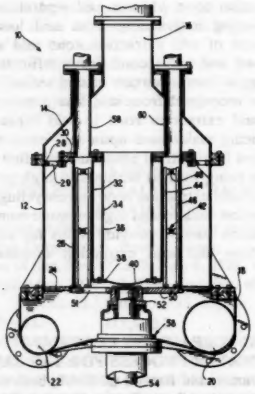
and repeating steps (c), (d) and (e) on an on-going basis to establish a control method for maximizing primary froth recovery.

5,009,774

PULSELESS SCREEN

Peter E. LeBlanc, Worthington, Mass., assignor to Beloit Corporation, Beloit, Wis.

Filed Oct. 30, 1989, Ser. No. 429,874
Int. Cl.[5] B07B *1/20*
U.S. Cl. 209—273 **22 Claims**



1. A screening apparatus for separating accepts and rejects of a slurry fed to the apparatus, said apparatus comprising:

a closed hollow housing including at least one side wall, first and second ends, and a slurry inlet at said first end, said housing having a longitudinal axis;

cylindrical screen means fixedly mounted in said housing, a first side of said screen means being in communication with said slurry inlet;

said screen means being disposed about said axis and extending generally axially in said housing from near said first end to near said second end;

a rotatable drive shaft extending into and journaled to said housing;

pulsing means connected to said drive shaft for rotation in a path of rotation adjacent said screen means on said first side of said screen means for inducing flow of slurry through said screen means;

a rejects outlet in flow communication with said first side of said screen means and in communication with the path of rotation of said pulsing means;

and an accepts outlet in flow communication with a second side of said screen means, said accepts outlet being located at one end of said screen means axially aligned with said screen means;

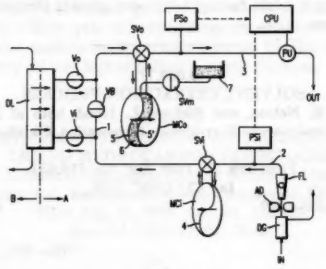
whereby the accepts are discharged axially from said housing generally along said axis of said housing of said screening apparatus.

5,009,775

METHOD OF CONTROLLING AMOUNT OF REMOVED WATER BY ULTRAFILTRATION AND CONTROL DEVICE FOR CONTROLLING AMOUNT OF REMOVED WATER BY ULTRAFILTRATION IN HEMODIALYSIS

Tsuyoshi Tsuji, Saitama; Masaaki Satoh, Tokyo, and Masayuki Yunoki, Saitama, all of Japan, assignors to Med-Tech Inc., Tokyo, Japan

Continuation of Ser. No. 180,952, Apr. 13, 1988. This application Jun. 1, 1990, Ser. No. 531,767
Int. Cl.[5] B01D *61/28, 61/34*
U.S. Cl. 210—85 **2 Claims**



1. A device for controlling the amount of removed water in a hemodialysis, comprising:

a dialyzer;

a supply circuit of dialysate and a drainage circuit of said dialysate, the supply circuit and the drainage circuit being respectively open circuit;

a plurality of electromagnetic valves for controlling flow of dialysate to said dialyzer;

means defining a first dialysate scaling chamber having a right and left partition separated by a diaphragm on the supply circuit of said dialyzer;

means defining a second dialysate scaling chamber including a right and left partition provided independently and sectioned by second diaphragm wherein said second scaling chamber is provided on the drainage circuit of said dialyzer;

first and second changeover valves respectively provided in association with said first and second scaling chambers wherein said right and left sectioned partitions of each of said chambers are changed alternately between an inlet side and an outlet side by said first and second changeover valves provided at each inlet and outlet;

a suction pump provided down stream of said second scaling chamber;

a bypass circuit provided by said plurality of electromagnetic valves to stop communication of dialysate to said dialyzer when said bypass circuit is formed;

a first and second pressure detector means provided at the supply circuit and the drainage circuit respectively of the dialyzer; and

a central control unit for changing over said changeover valves at the outlet and inlet of said respective scaling chambers by means of said central control unit on the basis of input information from said pressure detectors,

means for calculating a differential value of signals obtained from said pressure detectors,

means for operating the changeover valves when said differential value is in a fixed range,

means for calculating a difference of periods at the fluid supply side and the drainage side by detecting the period of each of said changeover valves,

means for calculating an amount of removed water by the difference between the periods measured and means for controlling said suction pump so that a predetermined amount of water is maintained.

5,009,776

FILTER SYSTEM

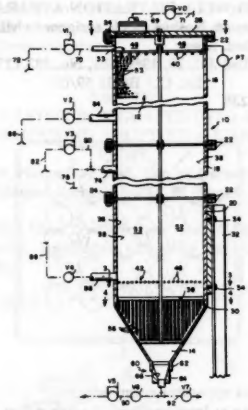
James V. Banks, Brockton, Mass., assignor to Control Fluidics, Inc., Greenwich, Conn.

Continuation of Ser. No. 97,285, Sep. 11, 1987, abandoned, which is a continuation of Ser. No. 755,466, Jul. 16, 1985, abandoned. This application Aug. 14, 1989, Ser. No. 394,307

The portion of the term of this patent subsequent to Dec. 5, 2006, has been disclaimed.

Int. Cl.[5] B01D *24/46*

U.S. Cl. 210—108 **7 Claims**



1. Apparatus for removing by filtering particulate solids from a liquid, comprising a vessel, means dividing the vessel into three vertically-disposed filter chambers closed at the top and open at the bottom, means for delivering the liquid containing the solids to be filtered therefrom into each filter chamber, a first grid disposed in each filter chamber adjacent but spaced downwardly from the top defining, in conjunction with the top, a fluid discharge chamber at the top of each filter chamber, said first grid comprising spaced, parallel bars of triangular cross section disposed with their apices facing upwardly, a second grid disposed at the lower end of each filter chamber above the lower end of the vessel such as to define in conjunction with the lower end of the vessel a solids discharge chamber below the second grids common to the lower ends of said filter chambers, said second grids comprising spaced, parallel bars of circular cross section, a fluid discharge conductor connected to each of said fluid discharge chambers at the top above the first grid, each of said fluid conductors containing a fluid discharge valve, a solids discharge conductor connected to the lower end of the vessel below the second grids containing a solids discharge valve, an inlet conductor connected to each filter chamber through which the liquid containing solids therein to be filtered can be introduced into each filter chamber, each inlet conductor containing an inlet valve, a bed of buoyant, particulate filter material disposed in each filter chamber between the grids, said buoyant particulate filter material being of a size such as to inhibit the passage of said buoyant particulate material between the bars of the grids, hence, to maintain the bed intact, pressure-sensitive means for sensing the pressure differential of the fluid in said filter chambers above and below the upper grid bars, first means operable when the pressure differential in any one of the filter chambers reaches a predetermined level to close said fluid discharge valve in the discharge conductor of that chamber, and second means for introducing air pressure into the top of that chamber to displace the bed of buoyant particulate filter material downwardly therein to thus disperse the particulate filter material and, hence, to cause the solids contained in the liquid to gravitate to the bottom for a period sufficient to clear the bed of solids, said second means being operable when the pressure differential is restored to disable the means for introducing air at the top and reopening the liquid discharge valve.

5,009,777

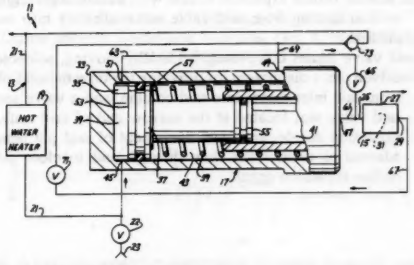
REVERSE OSMOSIS AND HOT WATER SYSTEM

Donald F. Solomon, 45640 Denizen Heights Rd., Hemet, Calif. 92344

Continuation-in-part of Ser. No. 350,521, May 11, 1989, which is a continuation-in-part of Ser. No. 111,697, Oct. 21, 1987, Pat. No. 4,836,924. This application Feb. 20, 1990, Ser. No. 481,515

Int. Cl.[5] B01D *61/10*

U.S. Cl. 210—134 **17 Claims**



1. A water system comprising:

a hot water system including a hot water heater and conduit means coupled to feedwater under pressure for conducting water to and from the hot water heater;

a reverse osmosis module having an inlet port, a product water port for filtered product water and a brine outlet port for brine;

an injector pump coupled to the feedwater under pressure and having a water port coupled to the inlet port of the reverse osmosis module and a brine port coupled to the brine outlet port of the reverse osmosis module and the conduit means; and

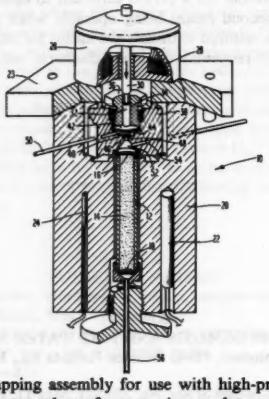
the injector pump including means for providing water to said water port of the injector pump for supplying to the inlet port of the reverse osmosis module and means for increasing the pressure of the brine at the brine port of the injector pump to greater than the pressure of the feedwater whereby the brine can be injected into said hot water system.

5,009,778

AXIALLY-DRIVEN VALVE CONTROLLED FLUID TRAPPING ASSEMBLY

Mark A. Nickerson; John S. Poole, and Lenore G. R. Frank, all of Landenberg, Pa., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation-in-part of Ser. No. 316,383, Feb. 27, 1989, abandoned. This application Aug. 31, 1989, Ser. No. 403,024
Int. Cl.[5] B01D *15/08*
U.S. Cl. 210—198.2 15 Claims



7. In a trapping assembly for use with high-pressure fluid systems having a column for removing a solute component of said fluid, said assembly comprising:

inlet means for introducing said fluid under high pressure into said assembly,

axially driven valve means for controlling the fluid through said inlet means,

an annular orifice expansion nozzle with a conical diverging section leading from said valve means directly into said column,

said valve means comprising: an axially-moving, solenoid-driven pin, a diaphragm for directing the flow of said fluid from said inlet means into said column, and a valve seat, said valve seat located at the narrow end of said orifice expansion nozzle, and axial movement of said pin being adapted to restrict the flow through and to close said orifice expansion nozzle.

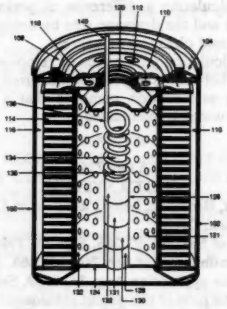
5,009,779

MAGNETIC ELEMENT WITH MAGNESIUM COIL FOR FILTER

Alfred M. Hebert, P.O. Box 706, Pleasant Valley, N.Y. 12569

Filed Dec. 11, 1989, Ser. No. 448,533
Int. Cl.[5] B01D *35/06*; B03C *1/30*
U.S. Cl. 210—223 2 Claims

1. An element for spin-on filters for removing metallic fines from a medium being filtered and for neutralizing sulphuric acids therein, comprising a base element having a lower recess therein for a magnet and an upper recess larger than said lower recess, extender elements stackable on said base element, an upper container within which are placed magnets spaced apart by flux spacer elements, said container nesting in the upper-



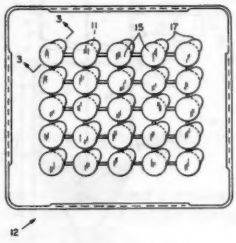
most extender element, and a magnesium coil on the exterior of said container.

5,009,780

MULTI-WELL FILTRATION APPARATUS

Michael J. Sarrasin, Nashua, N.H., assignor to Millipore Corporation, Bedford, Mass.

Filed Jul. 20, 1989, Ser. No. 383,127
Int. Cl.[5] B01D *69/00*
U.S. Cl. 210—238 5 Claims



1. A filtration apparatus comprising:

a plate having at least one well, having a first open end for introducing liquid into said well, a second end and an outside peripheral surface about said second end,

a filter membrane having a center section and a tab section, said center section being bonded to said peripheral surface, said tab section being formed with said center section and extending away from said peripheral surface, said tab section and said center section forming an exposed planar surface, and said tab section having a size and shape which permits removing said membrane from said peripheral surface while avoiding rupture of said membrane.

5,009,781

CROSS-FLOW FILTRATION DEVICE WITH FILTRATE NETWORK AND METHOD OF FORMING SAME

Robert L. Goldsmith, Belmont, Mass., assignor to CeraMem Corporation, Waltham, Mass.

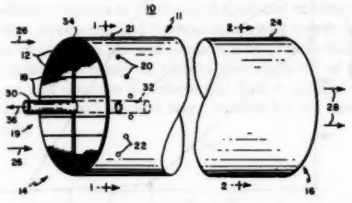
Continuation-in-part of Ser. No. 33,572, Apr. 2, 1987, Pat. No. 4,781,831. This application Oct. 5, 1988, Ser. No. 254,280
Int. Cl.[5] B01D *61/08*
U.S. Cl. 210—247 24 Claims

1. A cross-flow filtration device for receiving a feed stock at a feed end face and for separating the feed stock into filtrate and retentate, comprising:

a monolith of porous material defining a plurality of passageways extending longitudinally from the feed end face to a

retentate end face of the monolith through which the feed stock flows to pass retentate from the device, the surface area of the passageways being at least 100 square feet per cubic foot of monolith;

at least one filtrate network including a plurality of longitudinal filtrate chambers, at least one filtrate channel, and at least one filtrate duct, the filtrate channel transecting the filtrate chambers and communicating with the filtrate duct



to discharge filtrate from the filtrate chambers through the filtrate duct from at least one end face of the monolith; and

the filtrate chambers being isolated from both end faces of the monolith and being distributed among the passageways to provide low pressure drop flow paths for filtrate flow through the porous material from the passageways to nearby filtrate chambers.

5,009,782

LIQUID SEPARATOR INTEGRATED INTO A PRESSURE CHAMBER HOUSING ABUTTING A LIQUID RING PUMP

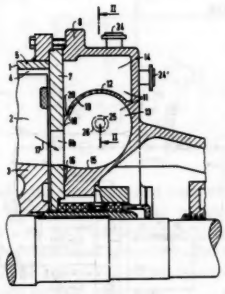
Peter Trimborn, Nuremberg, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Mar. 27, 1990, Ser. No. 500,085

Claims priority, application European Pat. Off., Apr. 11, 1989, 89106359.6

Int. Cl.[5] B01D *45/14*

U.S. Cl. 210—360.1 **12 Claims**



1. A liquid separator for a liquid ring pump, the pump having a pressure control disk with an inlet port and a discharge port, comprising:

a pressure chamber housing abutting the pressure control disk, said pressure chamber housing forming an inlet chamber and a discharge chamber, said discharge port leading into said discharge chamber;

means for imparting a cyclonic-type flow movement to a gas-liquid current including a deflector of curved design, in said discharge chamber, having a lateral edge on one side which extends axially in the direction of the gas-liquid current emerging from the discharge port, said deflector abutting the pressure control disk; and a liquid outlet and gas outlet on the abutting pressure chamber housing, with at least the gas outlet being disposed in the approximate center of the region defined by the curved deflector.

5,009,783

SEPARATION OF COMPOSITIONS CONTAINING WATER AND ORGANIC OXYGENATES

Craig R. Bartels, Wappinger Falls, N.Y., assignor to Texaco Inc., White Plains, N.Y.

Division of Ser. No. 456,619, Jan. 2, 1990. This application Jun. 4, 1990, Ser. No. 533,223

Int. Cl.[5] B01D *69/00*

U.S. Cl. 210—500.41 **4 Claims**

4. A composition comprising as a composite at least having properties for enabling pervaporation of a charge aqueous composition containing organic oxygenate selected from the group consisting of alcohols, glycols and weak acids, including:

(i) a polysulfone membrane as a porous support layer; and

(ii) mounted thereon, as a separating layer, a membrane of a blend of polyvinyl alcohol and polyacrylic acid;

said blend being characterized by a weight ratio of polyvinyl alcohol to polyacrylic acid of 0.1–10 and having been cured at 125° C.–225° for 1–30 minutes.

5,009,784

CYCLONE SEPARATOR WITH OPPOSITELY DIRECTED SEPARATING CHAMBERS

Neville Clarke, Naree Warren, and Reimer Z. Hansen, Mount Eliza, both of Australia, assignors to Conoco Specialty Products Inc., Houston, Tex.

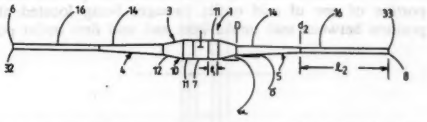
PCT No. PCT/AU87/00336, § 371 Date Jun. 1, 1989, § 102(e) Date Jun. 1, 1989, PCT Pub. No. WO88/02280, PCT Pub. Date Apr. 7, 1988

PCT Filed Oct. 2, 1987, Ser. No. 343,178

Claims priority, application Australia, Oct. 3, 1986, PH8333

Int. Cl.[5] B01D *17/038*

U.S. Cl. 210—512.1 **9 Claims**



1. A cyclone separator comprising elements designed, sized and arranged for treating a mixture of liquids including oil and water phases, for separating at least in part a more dense liquid component of the mixture from a less dense liquid component thereof, the cyclone separator being characterized by a stationary separating chamber having a central axis of symmetry between opposite first and second ends, the separating chamber including two tapered parts and an intermediate portion which is intermediate said ends between said tapered parts, the intermediate portion being of greater cross sectional dimension than either of the opposed ends, each said part comprises a primary portion adjacent said intermediate portion a conical section a secondary portion of generally conical shape and of a smaller angle of conicity than said conical section and a tertiary portion of generally cylindrical shape, the separating chamber having first outlet means for discharging the more dense liquid component of the separated phases and second outlet means for discharging the less dense liquid component of the separated phases, the separator further including feed inlet means proximate to the intermediate portion.

5,009,785

SYSTEM AND APPARATUS FOR THE SEPARATION OF MULTI-PHASE MIXTURE

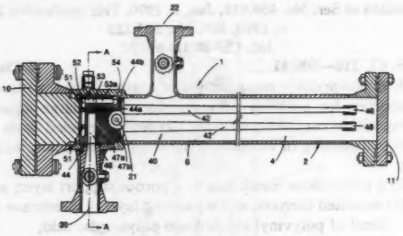
David A. Webb, Northcote, Australia, assignor to Conoco Specialty Products Inc., Houston, Tex.

Continuation-in-part of Ser. No. 6,558, Feb. 20, 1987, abandoned. This application Feb. 13, 1989, Ser. No. 310,279

Claims priority, applicaiton Australia, Apr. 23, 1985, PH0274; Apr. 23, 1988, PCT/AU86/00111

Int. Cl.[5] B04C *7/00*

U.S. Cl. 210—512.2 16 Claims



1. Apparatus for separating multi-phase mixtures or at least partially separating a more dense component of a mixture from a less dense component thereof, the apparatus comprising; an outer casing defining a cavity therein, an intake port through which the mixture is fed to the apparatus, a first outlet port from which a more dense component can be discharged from the apparatus and a second outlet port from which a less dense component can be discharged from the apparatus; the apparatus further including a cyclone separating means locatable within said cavity and which comprises a plurality of longitudinal separating chambers, each chamber having a portion which has a greater cross-sectional dimension at one end than at its other end, each chamber further comprising inlet means and at least two outlets; a head portion integrally connected to each of said separating chambers and having a first outlet passage formed within the head portion and transverse to said longitudinal separating chambers in fluid communication with one outlet of each of said separating chambers and a second outlet passage within said head portion which is parallel with said longitudinal separating chambers; and means for communicating said first and second outlet passages with said second outlet port, the other of said outlets of each separating chamber being in communication with said first outlet port, at least a portion of one of said outlet passages being located at a position between said intake port and said first outlet port.

5,009,786

SELENATE REMOVAL FROM WASTE WATER

Ronald S. Oremland, San Francisco, Calif., assignor to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Oct. 30, 1989, Ser. No. 428,699

Int. Cl.[5] C02F *3/30*

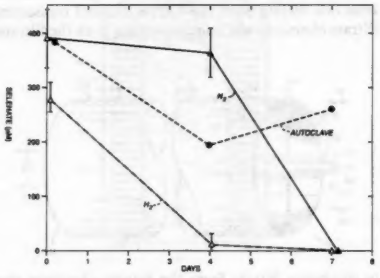
U.S. Cl. 210—602 13 Claims

1. A method for the removal of selenium from agricultural waste waters wherein said agricultural waste waters comprise selenium and nitrate, comprising the steps of

providing a first treatment zone, said first treatment zone comprising biological organisms capable of removing said nitrate from said waste water and assimilating said nitrate into biomass,

treating said agricultural waste water in said first treatment zone under aerobic conditions until the concentration of nitrate in effluent from said first treatment zone is substantially reduced in a range about 1 to 0.1 mM.

providing a second treatment zone, said second treatment zone removed from said first treatment zone, said second treatment zone comprising substantially anoxic conditions and biological organisms enriched for biological organisms that respire selenate under substantially anoxic conditions



treating the effluent from said first treatment zone in said second treatment zone until the concentration of selenate in effluent from said second treatment zone is substantially reduced in a range about 0.01 to 0.001 mg/l.

5,009,787

LIQUID-TO-LIQUID OIL ABSORPTION METHOD

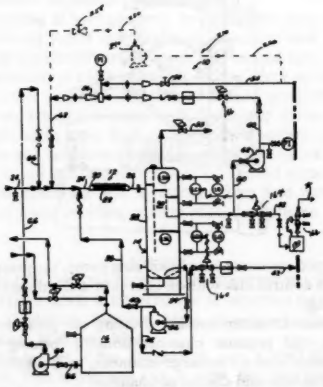
Paul C. Broussard, Sr., P.O. Box 32504, Lafayette, La. 70503

Continuation of Ser. No. 160,864, Feb. 26, 1988, Pat. No. 4,839,043, which is a continuation-in-part of Ser. No. 938,397, Dec. 5, 1986, Pat. No. 4,728,428. This application Dec. 19, 1988, Ser. No. 286,234

The portion of the term of this patent subsequent to Mar. 1, 2005, has been disclaimed.

Int. Cl.[5] B01D *12/00*

U.S. Cl. 210—634 5 Claims



1. A method for degreasing water, which comprises contacting contaminated produced-water with a volatile non-water-soluble liquid fluorocarbon to dissolve both dissolved and suspended contaminants from said produced-water; separating the spent fluorocarbon from the degreased water; and, recycling separated spent fluorocarbon to the contacting step by means of an eductor jet pump driven by said degreased water.

5,009,788

METHOD FOR REMOVING ORGANIC AND TUNGSTEN FROM SODIUM SULFATE SOLUTION

Tai K. Kim, and Clarence D. Vanderpool, both of Towanda, Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Apr. 4, 1990, Ser. No. 504,478
Int. Cl.[5] B01D *11/04*
U.S. Cl. 210—639 1 Claim

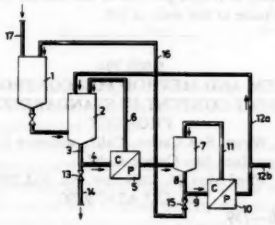
1. A method for removing organic and tungsten from sodium sulfate solutions to render said solutions suitable for ion membrane processing, said method comprising contacting said solution wherein the pH said solution is no greater than about 7, with activated carbon to remove essentially all of said organic and said tungsten therefrom and form a purified sodium sulfate solution, said solution being suitable for ion membrane processing.

5,009,789

METHOD AND PLANT FOR SEPARATION OF SYNTHETIC WATER SOLUBLE POLYMERS

Ulla K. E. Helmer, Sollentuna, and Karl-Erland M. Stensiö, Järfälla, both of Sweden, assignors to EKA Nobel, Surte, Sweden

PCT No. PCT/SE87/00637, § 371 Date Jun. 22, 1989, § 102(e) Date Jun. 22, 1989, PCT Pub. No. WO88/05444, PCT Pub. Date Jul. 28, 1988
PCT Filed Dec. 29, 1987, Ser. No. 375,015
Claims priority, application Sweden, Jan. 19, 1987, 8700187
Int. Cl.[5] B01D *61/20*
U.S. Cl. 210—641 16 Claims



1. A method for the separation and reuse of synthetic water-soluble resins of different molecular weight produced in a polymerization zone, said water-soluble resins being selected from the group consisting of urea-formaldehyde resins, melamine-formaldehyde resins and polyamidoamine-epichlorohydrin resins, which method comprises

(1) charging an aqueous solution of said water-soluble synthetic resin to an ultrafiltration unit,

(2) in said ultrafiltration unit effecting separation of said solution into

(a) a concentrate solution which mainly comprises polymers of high molecular weight, and

(b) an aqueous permeate solution which mainly comprises polymers of low molecular weight, monomers and byproducts,

(3) the separation according to step (2) being carried out so that at least 5 percent by weight of the original dry resin content is separated off in said permeate solution, and

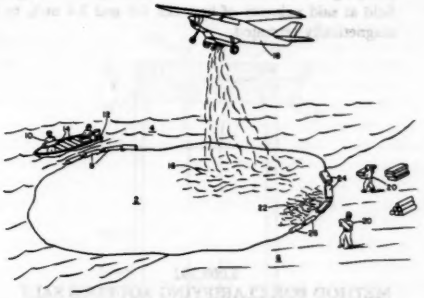
(4) recirculating said separated permeate solution to the polymerization zone for further polymerization.

5,009,790

METHOD FOR ABSORBING LIQUIDS USING DEALGINATE KELP

Michael R. Bustamante, Chula Vista; John J. Renaker, Jr., Valley Center, and Donald A. Magley, Chula Vista, all of Calif., assignors to Damcosur S.A. De C.V., Chula Vista, Calif.

Filed Aug. 20, 1990, Ser. No. 569,633
Int. Cl.[5] C02F *1/28;* B01J *20/22*
U.S. Cl. 210—689 12 Claims



1. A method for the absorption of a liquid which comprises applying to a body of said liquid an absorbent composition which comprises dealginated, partially dewatered kelp residue.

5,009,791

MAGNETIC TREATMENT OF WATER USED FOR AGRICULTURAL PURPOSES

Israel J. Lin, Post Hof Hacarmel, Kerem Maharal, Israel 30840 , and Jacob Yotvat, 31 Harishonim Street, Kiriat Haim, Israel 26302

Filed Aug. 18, 1989, Ser. No. 395,897
Claims priority, application Israel, Jul. 17, 1989, 091014
Int. Cl.[5] C02F *1/48;* B01D *35/02;* A01K *7/02*
U.S. Cl. 210—695 4 Claims

1. A method of magnetically treating water for watering of livestock, comprising the steps of:

(a) mechanically cleaning the water so as to remove ferromagnetic particles and other suspended matter therefrom;

(b) causing the water to pass through a magnetic field of alternating polarity wherein

said magnetic field is of an intensity of between 600 and 6500 gauss, and has a field gradient of between 0.2 and 6.0 kgauss/cm;

said water passing through said magnetic field flows in a

direction which is substantially perpendicular to the magnetic field vector of said magnetic field;

said water flow through said magnetic field is substantially laminar, at a velocity of between 0.5 and 2.4 m/s; and

said laminar water flow is at a velocity for causing each water molecule of said laminar water flow to pass through said magnetic field of alternating polarity at a frequency of not less than 2 and not more than 60 polarity changes per second; and

(c) recirculating water not consumed by said livestock by pumping the unconsumed water through said magnetic field at said velocity of between 0.5 and 2.4 m/s, to be magnetically retreated.

5,009,792

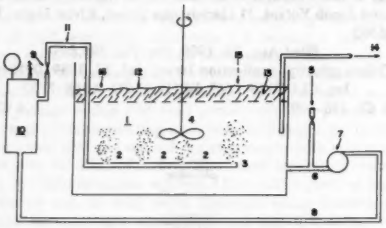
METHOD FOR CLARIFYING AQUEOUS SALT SOLUTIONS

Jarl M. Pettersen, Larvik; Arild Nilsson, Skien, both of Norway, and Robert M. Millaway, Hayward, Calif., assignors to Norsk Hydro a.s., Oslo, Norway

Filed Oct. 24, 1989, Ser. No. 425,977

Int. Cl.[5] B03D *1/02*

U.S. Cl. 210—705 **4 Claims**



1. A method of clarifying an aqueous salt solution containing inorganic insolubles, comprising:

providing a vessel for the aqueous salt solution;

providing a recirculating system for the aqueous salt solution in said vessel circulating aqueous salt solution therefrom and thereto;

introducing air into said recirculating system;

pressurizing said air in said recirculating system;

releasing said air into said aqueous salt solution such that said air forms microbubbles in said aqueous salt solution;

adding flocculants to said aqueous salt solution;

ensuring the presence of sufficient foam forming organic components in said aqueous salt solution to form a stable foamy sludge, wherein said air, said flocculants and said organic components form the stable foamy sludge on said aqueous salt solution, flotating said inorganic insolubles out of said aqueous salt solution;

interrupting the release of said air into said aqueous salt solution;

back-mixing a portion of said stable foamy sludge into said aqueous salt solution; and

restarting the release of said air into said aqueous salt solution for the flotation of remaining said inorganic solubles to obtain a clarified aqueous salt solution.

5,009,793

PROCESS FOR THE SEPARATION OF HEAVY METALS FROM WASTE MATERIALS

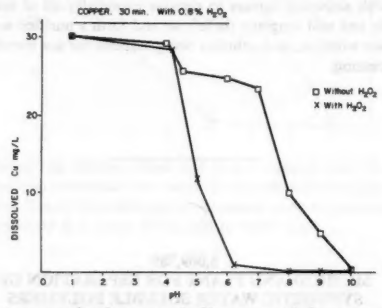
German Muller, Bammental, Fed. Rep. of Germany, assignor to Industrie Automation Sondertechnik GmbH & Co., Heidelberg, Fed. Rep. of Germany

Filed Jan. 9, 1990, Ser. No. 462,580

Claims priority, application European Pat. Off., Jan. 13, 1989, 89100518.3

Int. Cl.[5] C02F *1/52, 1/72*

U.S. Cl. 210—710 **21 Claims**



1. A process for the removal of heavy-metals from a contaminated waste material including lead and having at least a first heavy-metal and a second heavy-metal comprising the steps of:

treating the waste material with an acid to dissolve the heavy metals as water-soluble salts;

treating the water-soluble salts with an oxidizing agent;

forming a hydroxide of at least the first heavy-metal;

precipitating at least a portion of the first heavy-metal as a hydroxide at a first pH of below about 5;

adjusting the pH to a second pH which is different from the first pH; and

precipitating at least a portion of the second heavy-metal as a hydroxide at the second pH.

5,009,794

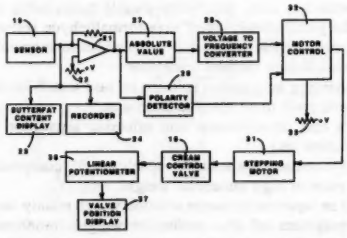
SYSTEM AND METHOD FOR CONTROLLING BUTTERFAT CONTENT IN STANDARDIZED MILK PRODUCT

William H. Wynn, San Carlos, Calif., assignor to Wedgewood Technology, Inc., San Carlos, Calif.

Filed May 16, 1989, Ser. No. 352,259

Int. Cl.[5] A23C *9/00*

U.S. Cl. 210—739 **21 Claims**



14. In a method of controlling fat content in a standardized milk product produced by combining high fat milk and low fat milk, the steps of: setting a desired fat content for the milk product and providing a reference signal corresponding thereto, continuously monitoring the milk product with an optical density sensor and providing a signal corresponding to

the actual fat content in said product, monitoring the reference signal and the sensor signal to provide an error voltage having a magnitude which decreases as the difference between the actual fat content and the desired fat content decreases, applying the error signal to a voltage to frequency converter to produce a control signal containing pulses occurring at a rate which as the difference between the actual fat content and the desired fat content decreases, advancing a stepping motor by one step on response to each pulse in the control signal, and driving a control valve with the stepping motor to adjust the relative amounts of high fat milk and low fat milk which are combined to produce the standardized product at a rate which decreases as the actual fat content approaches the desired fat content.

5,009,795

PROCESS FOR THE DEWATERING OF SOLIDS SUSPENDED IN WATER AND SCREW PRESS SEPARATOR THEREFOR

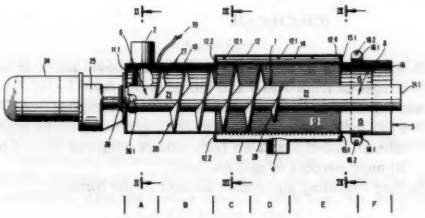
Dietrich Eichler, Groskarolinenfeld, Fed. Rep. of Germany, assignor to Fan Engineering GmbH, Sunninghausen, Fed. Rep. of Germany

Filed Nov. 3, 1989, Ser. No. 431,073

Claims priority, application Fed. Rep. of Germany, Nov. 3, 1988, 3837331; Mar. 4, 1989, 3907046; Sep. 1, 1989, 3929090

Int. Cl.[5] C02F 1/00

U.S. Cl. 210—744 **28 Claims**



1. A process for separating and dewatering solids contained in waste water in a concentration therein of less than about ten percent, comprising the steps of:

introducing said waste water into a space defined by a housing, a cylindrical strainer basket aligned with an outlet end of said housing, and cylindrical tube means aligned with an outlet end of said strainer basket, said strainer basket being apertured for the passage of waste, said tube means defining a solids discharge opening at a terminal end thereof, said tube means comprising a cylindrical mouthpiece and a cylindrical mouthpiece extension telescopingly adjustably connected to said mouthpiece, said waste water being introduced into a portion of said space defined by said housing,

rotating a screw disposed in said space and having a discharge end terminating short of said outlet end of said strainer basket, to advance said waste water into said strainer basket whereby water separated from said solids passes laterally through said strainer basket, and a solid slug is formed which extends from said discharge end of said screw to said solids discharge laterally against an inner surface of said cylindrical strainer basket while being advanced therethrough, and

adjusting said mouthpiece extension relative to said mouthpiece to vary the length of said tube means for varying the resistance to travel of said slug, said mouthpiece extension being adjusted such that from five to thirty percent of said slug is disposed in said tube means.

5,009,796

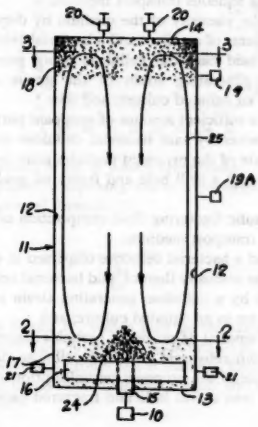
METHODS AND APPARATUS FOR TREATING A MIXTURE OF PARTICLES AND FLUIDS

Michael A. Petrik, Highland Heights, Ohio; Robert J. Adler, 3068 Van Aken Blvd., Cleveland, Ohio 44120, and Jonathan D. Wineland, Madison, Ind., assignors to Robert Adler, Cleveland, Ohio

Filed Mar. 24, 1986, Ser. No. 843,055

Int. Cl.[5] B04C 7/00

U.S. Cl. 210—787 **28 Claims**



1. Apparatus for the treatment of particles, comprising

a container having an axis and a sidewall surrounding said axis;

impeller means located in said container at a first position along said axis and rotatable upon said axis; and

barrier means located in said container at a second position along said axis, to interrupt flow parallel to said axis of fluids flowing within said container;

said sidewall having generally circular cross-section at first and second positions, and all intermediate positions, along said axis and with said axis at the circular center, and said sidewall cross-section surrounding said axis at said second position having a diameter no less than one-quarter of the diameter of said sidewall cross-section surrounding said axis at said first position; and

said container lacking baffle means, and said impeller means and barrier means being sufficiently separated with respect to each other, that rotation of said impeller generates in said fluid a circulating current, said current having a positive component of rotational flow about said axis everywhere oriented in the direction of said rotation of said impeller, and having a positive component of axial flow toward said impeller in the vicinity of said axis and a positive component of axial flow away from said impeller in the vicinity of said sidewall, and that for at least one combination of a particle, fluid and impeller speed, when said particle and said fluid are put in said container and said impeller means is rotated at said impeller speed, said current will carry said particle to the vicinity of said barrier means, where said particle will separate from said current and remain in said vicinity of said barrier means; and further comprising

first port means for the introduction into said container of fluids and particles, and second port means for the a withdrawal from said container of fluids and particles, said second port means being located upon said sidewall.

5,009,797

METHOD OF SUPPORTING FRACTURES IN GEOLOGIC FORMATIONS AND HYDRAULIC FLUID COMPOSITION FOR SAME

Glenn S. Penny, Duncan, Okla.; Robert S. Stephens, Auburn, and Alan R. Winslow, Tacoma, both of Wash., assignors to Weyerhaeuser Company, Tacoma, Wash.

Filed Dec. 13, 1989, Ser. No. 450,360
Int. Cl.[5] E21B *43/26*
U.S. Cl. 252—8.551 19 Claims

1. A method of preparing a hydraulic fracturing fluid composition which comprises:

providing an aqueous transport medium;

increasing the viscosity of the medium by dispersing sufficient amounts of a gellant and a bacterial cellulose in said medium, said bacterial cellulose being produced by a cellulose generating strain of the genus Acetobacter grown in an agitated culture; and then

suspending a sufficient amount of proppant particles in said medium whereby said bacterial cellulose decreases the settling rate of the proppant particles prior to and during transport into a drill hole and fractured geologic formation.

10. A hydraulic fracturing fluid composition comprising:

an aqueous transport medium;

a gellant and a bacterial cellulose dispersed in said medium to raise the viscosity thereof, said bacterial cellulose being produced by a cellulose generating strain of the genus Acetobacter in an agitated culture; and

a sufficient amount of proppant particles suspended in said medium whereby said bacterial cellulose decreases the settling rate of the proppant particles prior to and during transport into a drill hole and fractured geologic formation.

5,009,798

LOW FLUID LOSS HEAVY BRINES CONTAINING HYDROXYETHYL CELLULOSE

Roy F. House, Houston, and Lonnie D. Hoover, Chappell Hill, both of Tex., assignors to Baroid Technology, Inc., Houston, Tex.

Continuation of Ser. No. 80,203, Jul. 29, 1987, abandoned, which is a continuation of Ser. No. 357,308, Mar. 11, 1982, abandoned, which is a continuation-in-part of Ser. No. 161,444, Jun. 20, 1980, Pat. No. 4,420,406. This application Apr. 10, 1989, Ser. No. 336,592
The portion of the term of this patent subsequent to Dec. 13, 2000, has been disclaimed.
Int. Cl.[5] E21B *43/00*
U.S. Cl. 252—8.551 8 Claims

1. A method of decreasing the fluid loss of heavy brines containing zinc bromide and at least one soluble salt selected from the group consisting of calcium chloride and calcium bromide, which comprises sequentially carrying out the steps of adjusting the concentration of zinc bromide in said brine to the range from about 16% to about 20% by weight, and mixing with said brine a fluid loss reducing amount of hydroxyethyl cellulose which has been activated by admixing said hydroxyethyl cellulose with an aqueous liquid having a pH of greater than 7 and a water-soluble polar organic liquid which when uniformly mixed with hydroxyethyl cellulose in a weight ratio of hydroxyethyl cellulose to polar organic liquid of 1:2 produces a mixture with free liquid present after remaining quiescent for one week at ambient temperature in a sealed container, said hydroxyethyl cellulose being incompletely solubilized in said brine whereby a portion of said hydroxyethyl cellulose acts as a bridging agent.

5,009,799

INORGANIC ACID SOLUTION VISCOSIFIER AND CORROSION INHIBITOR AND METHOD

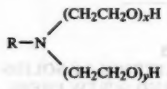
Allen R. Syrinek, Richmond; Ralph N. Buggs, Missouri City, and Robert K. Gabel, Houston, all of Tex., assignors to Nalco Chemical Company, Naperville, Ill.

Filed Feb. 16, 1988, Ser. No. 155,861
Int. Cl.[5] E21B *43/27*
U.S. Cl. 252—8.553 16 Claims

1. A viscosifier for aqueous inorganic acid solutions comprising:

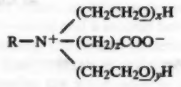
a mixture of ethoxylated fatty amines and betaine inner salts of said ethoxylated fatty amines,

wherein said ethoxylated fatty amines are of the formula



wherein R is selected from saturated and unsaturated alkyl groups having from 8 to 24 carbon atoms and mixtures thereof, and x and y separately are integers and together have an average value of from 1.00 to 2.5,

wherein said betaine inner salts of said ethoxylated fatty amines are of the formula



wherein R, x, and y are as defined above and z in an integer of from 1 to 3 and mixtures thereof,

and wherein said ethoxylated fatty amines comprise from 70 to 95 mole percent of said mixture and said betaine inner salts of said ethoxylated fatty amines comprise from 5 to 30 mole percent of said mixture;

further including an organic alcohol of the formula

wherein R' is an unsaturated alkyne group having from 3 to 10 carbon atoms, wherein said organic alcohol is present in said viscosifier in the amount of at least 0.5 weight percent based on total mixture of said ethoxylated fatty amines and said betaine inner salts of said ethoxylated fatty amines; and

an alkyl pyridine quaternary ammonium salt, wherein the alkyl substituents on pyridine are selected from saturated and unsaturated alkyl groups having separately from 1 to 8 carbon atoms and together on a single pyridine moiety have no more than 10 carbon atoms, and mixtures thereof, wherein said alkyl pyridine quaternary ammonium salt is present in said viscosifier in the amount of at least 0.5 weight percent based on total mixture of said ethoxylated fatty amines and said betaine inner salts of ethoxylated fatty amines.

7. A viscosified inorganic acid solution comprising:

an inorganic acid;

water; and

an effective amount of a viscosifier as defined in claim 1.

12. In a method of treating hydrocarbon-producing rock formations with acid by introducing an acid fluid into contact with the formation, the improvement comprising the use of an acid fluid comprising:

an inorganic acid;

water; and

an effective amount of a viscosifier as defined in claim 1.

5,009,800

FABRIC SOFTENING ADDITIVE FOR DETERGENT COMPOSITIONS: CELLULOSE ETHER AND ORGANIC FABRIC SOFTENER

Francis G. Foster, Wirral, England, assignor to Lever Brothers Company, Division of Conopco Inc., New York, N.Y.

Continuation of Ser. No. 278,696, Dec. 1, 1988, abandoned. This application Jun. 13, 1990, Ser. No. 537,225

Claims priority, application United Kingdom, Dec. 1, 1987, 8728958

Int. Cl.[5] C11D *1/62, 3/22*

U.S. Cl. 252—8.9 7 Claims

1. A particulate fabric softening additive for detergent compositions, comprising as the sole or major component, an intimate mixture of a water-soluble nonionic cellulose ether and an organic fabric softening agent selected from the group consisting of quaternary ammonium compounds, imidazolinium derivatives, fatty amines, soaps, organo-modified clays and mixtures thereof in the weight ratio of from 1:1 to 0.06:1, the cellulose ether being an alkyl hydroxyalkyl cellulose in which the alkyl group is selected from methyl and ethyl and the hydroxyalkyl group is selected from hydroxyethyl and hydroxypropyl, the cellulose ether having a degree of substitution of from 1.9 to 3 and from 0.9 to 2.0 alkyl groups and from 0.1 to 2. 0 hydroxyethyl groups per anhydroglucose ring and having an HLB of between 3.3 and 3.8, and a gel point of 33° C. to 56° C.

5,009,801

COMPOSITIONS FOR PREVENTING STRESS CRACKS IN POLY(ALKYLENE TEREPHTHALATE) ARTICLES AND METHODS OF USE THEREFOR

Michael Wider, Pleasant Ridge; Charles Rossio, Carleton, and Christian Remus, Detroit, all of Mich., assignors to Diversey Corporation, Mississauga, Ontario, Canada

Continuation-in-part of Ser. No. 218,893, Jul. 14, 1988, Pat. No. 4,929,375. This application Aug. 25, 1989, Ser. No. 398,542

Int. Cl.[5] C10M *173/02*

U.S. Cl. 252—033.2 14 Claims

1. A method of inhibiting stress cracking in a poly(alkylene terephthalate) article of manufacture, comprising:

applying a lubricant to an exterior surface of the poly(alkylene terephthalate) article of manufacture, the lubricant comprising a stress crack inhibitor which comprises a hydrophilic-substituted aromatic hydrocarbon having either an alkyl or an aryl side chain.

5,009,802

PHENOLIC ANTIOXIDANT COMPOSITION

William Y. Lam, Ballwin, and Gregory P. Liesen, St. Louis, both of Mo., assignors to Ethyl Corporation, Richmond, Va.

Filed Nov. 29, 1989, Ser. No. 442,657

Int. Cl.[5] C10M *135/02*

U.S. Cl. 252—48.2 19 Claims

1. A liquid, partially sulfurized, hindered phenol product prepared by the process comprising reacting a liquid mixture of phenols, at least about 50 weight percent of said mixture consisting of one or more reactive, hindered phenols, with sulfur monochloride in proportions to provide from about 0.3 to 0.7 gram atoms of sulfur per mole of reactive, hindered phenol, so as to produce a liquid product.

5,009,803

LUBRICANT FLUID FOR THE COLD-ROLLING OF STEEL

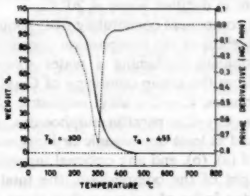
Ernesto Brandolese, Graffignana, Italy, assignor to Agip Petroli S.p.A., Rome, Italy

Filed Apr. 10, 1990, Ser. No. 506,816

Claims priority, application Italy, Apr. 18, 1989, 20191 A/89

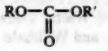
Int. Cl.[5] C10M *173/00*

U.S. Cl. 252—49.5 8 Claims



1. An emulsion of oil in water, comprising:

(a) an oil phase, comprising one or more organic carbonates of the general formula (I)



(I)

wherein R and R', which may be the same or different, represent a C_6–C_{30} linear or branched alkyl, cycloalkyl, or cycloalkyl-alkyl group; and at least one emulsifier selected from the group consisting of non-ionic and anionic surfactants; and

(b) water;

wherein said oil phase is present in an amount of between 1 and 5 wt. %.

5,009,804

GRANULAR LAUNDRY COMPOSITIONS CONTAINING MULTI INGREDIENT COMPONENTS HAVING DISPARATE RATES OF SOLUBILITY

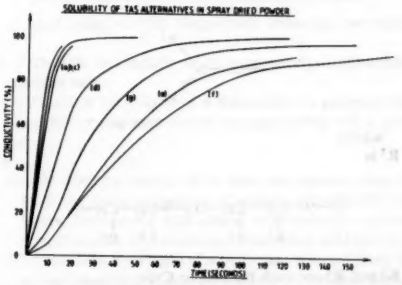
Simon N. Clayton, West Jesmond; Peter M. Lambert, Cleckheaton, both of England, and Jean Wevers, Grimbergen, Belgium, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed May 15, 1989, Ser. No. 351,972

Claims priority, application United Kingdom, May 13, 1988, 8811447

Int. Cl.[5] C11D *17/06, 1/12*

U.S. Cl. 252—90 11 Claims



1. A solid detergent composition, wherein said composition is composed of at least two particulate multi ingredient components, a first one of said components consisting essentially of, by weight, a spray dried particulate incorporating an anionic surfactant selected from the group consisting of C_{16}–C_{22} alkyl

sulfate salts, C_{16}–C_{24} alkyl carboxylate salts, and mixtures thereof, and being substantially free of other anionic surfactants, in an amount of from about 0.75% to about 30% and one or more inorganic and/or organic salts in an amount of from about 99.25% to about 70%, said composition optionally including additional dry mixed detergent ingredients wherein;

(a) said first component comprises from about 30% to about 99% by weight of the composition and has a T_{95} value of from about 40 to about 180, T_{95} being the time in seconds to achieve 95% solution of a 1% weight mixture of the component in distilled water at 20° C.;

(b) a second component constituting from about 1% to about 70% by weight of the composition consisting essentially of a particulate containing a water soluble surfactant selected from the group consisting of C_{11}–C_{15} alkyl benzene sulfonates, C_{11}–C_{15} alkyl sulphates, C_{12}–C_{16} olefin sulfonates, C_{11}–C_{16} paraffin sulphonates, and mixtures thereof; and at least one organic or inorganic salt;

the amounts of (a), (b), and any optional ingredients totalling 100% by weight of the composition, the total composition having a Residue Index of not more than about 30%.

5,009,805

LIQUID DETERGENT WITH COPOLYMER ADDITIVE

Johannes Perner, Neustadt; Paul Diessel, Mutterstadt; Heinrich Hartmann, Limburgerhof; Walter Denzinger, Speyer; Alfred Oftring, Bad Duerkheim, and Willibald Schoenleben, Heidelberg, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Oct. 19, 1989, Ser. No. 424,084

Claims priority, application Fed. Rep. of Germany, Nov. 10, 1988, 3838093

Int. Cl.[5] C11D *3/37*

U.S. Cl. 252—174.24 **7 Claims**

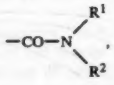
1. A liquid detergent formulation, containing as essential constituents

(1) one or more anionic surfactants, one or more non-ionic surfactants or a mixture thereof,

(2) 0.1–20% by weight of a copolymer containing as essential constituents

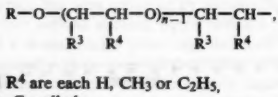
(a) 50–99 mol % of units of a monoethylenically unsaturated C_3–C_8-monocarboxylic acid, a monoethylenically unsaturated C_4–C_8-dicarboxylic acid, a half ester of a monoethylenically unsaturated C_4–C_8-dicarboxylic acid, an ester of a monoethylenically unsaturated C_3–C_8-monocarboxylic acid, a C_2–C_{30}-olefin, styrene, a C_1–C_3-alkylstyrene, a C_1–C_{28}-alkyl vinyl ether, a vinyl ester of a saturated C_1–C_8-monocarboxylic acid or a mixture thereof and

(b) 50–1 mol % of units of an amide of a monoethylenically unsaturated C_3–C_8-carboxylic acid where the amide groups have the structure



where

R^1 is



R^3 and R^4 are each H, CH_3 or C_2H_5,

R is C_1–C_{28}-alkyl,

n is from 2 to 100 and

R^2 is H or R^1,

as copolymerized units, and has a K value of from 8 to 200 (determined by the method of H. Fikentscher in aqueous solution at 25° C., pH 7.5 and a polymer concentration of 1% by weight), or a salt thereof and

(3) water.

5,009,806

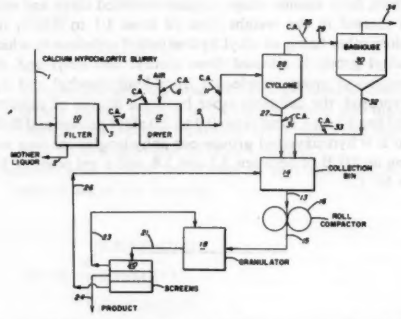
CALCIUM HYPOCHLORITE ARTICLE

Harlan B. Johnson, Rittman; Charles R. Wiedrich, Wadsworth; Ernie L. Allen, Barberton, all of Ohio, and Peter P. Howell, New Martinsville, W. Va., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 377,676, Jul. 10, 1989, Pat. No. 4,970,020, which is a division of Ser. No. 178,180, Apr. 6, 1988, Pat. No. 4,865,760. This application Jul. 17, 1990, Ser. No. 554,224

Int. Cl.[5] D06L *3/08*; C01B *11/06*; C02F *1/76*

U.S. Cl. 252—187.28 **12 Claims**



6. A solid formed article comprising a compressed article of a composition comprising a mixture of (a) from about 5 to about 20 parts of calcium hypochlorite powder having an average particle size of less than about 10 microns, (b) from about 95 to about 80 parts of particulate calcium hypochlorite, and (c) form about 0.001 to about 1.0 weight percent of unfibrillated polyfluorinated polymer.

5,009,807

NIOBIUM-ACTIVATED YTTRIUM TANTALATE X-RAY PHOSPHOR WITH IMPROVED BRIGHTNESS AND METHOD OF MAKING SAME

V. Butchi Reddy, Sayre, Pa., assignor to GTE Products Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 459,891, Jan. 2, 1990, Pat. No. 4,970,024. This application Aug. 6, 1990, Ser. No. 563,133

The portion of the term of this patent subsequent to Nov. 13, 2007, has been disclaimed.

Int. Cl.[5] C09K *11/78*

U.S. Cl. 252—301.4 H **5 Claims**

1. A niobium-activated yttrium tantalate x-ray phosphor containing rubidium halide or cesium halide, strontium halide or barium halide and, optionally, gallium oxide or aluminum oxide incorporated therein, made by forming a uniform mixture of the following ingredients in the following proportions:

one mole of yttrium oxide;

0.995 mole of tantalum oxide;

0.005 mole of niobium oxide;

from 0.001 mole to 0.01 mole of rubidium halide or cesium halide;

from 0.01 mole to 0.10 mole of strontium halide or barium halide;

and, optionally, from 0.01 mole to 0.04 mole of gallium oxide or aluminum oxide;

blending said mixture with a lithium chloride-lithium sulfate eutectic flux composition;

firing said mixture at about 1200°–1300° C. for about 10–12 hours to form said phosphor;

washing said phosphor in deionized water to remove said flux; and

filtering, drying and classifying said phosphor, said phosphor exhibiting a higher brightness than the phosphor prepared as above absent rubidium halide, cesium halide, strontium halide, barium halide, gallium oxide and aluminum oxide.

5,009,808

PROCESS FOR PRODUCING ELECTROLUMINESCENT YELLOW ZINC SULFIDE PHOSPHORS

Kenneth T. Reilly; Richard G. W. Gingerich, and Christopher S. Poss, all of Towanda, Pa., assignors to GTE Products Corporation, Stamford, Conn.

Continuation of Ser. No. 289,882, Dec. 27, 1988, abandoned. This application Jan. 11, 1990, Ser. No. 462,922

Int. Cl.[5] C09K *11/56*

U.S. Cl. 252—301.60 S **1 Claim**

1. A process for producing an electroluminescent phosphor consisting essentially of:

(a) blending a chloride flux, a copper source, and zinc sulfide to form a relatively uniform admixture;

(b) heating the resulting admixture at a temperature of from about 1000° C. to about 1300° C. for about 2 to about 8 hours to convert at least a portion of the admixture to a crystalline material containing zinc sulfide of a hexagonal crystal structure, at least some chloride ions and copper ions;

(c) washing the resulting material with sufficient water to remove at least a major portion of the water soluble material from the crystalline material;

(d) drying the washed material to produce a relatively moisture-free material;

(e) subjecting the moisture-free material to low intensity milling for a sufficient time to change the crystallographic structure of at least a portion of the moisture-free material from a hexagonal to a cubic structure;

(f) blending the cooled material, which material is essentially nonelectroluminescent, with copper sulfate and zinc sulfate and sufficient manganese carbonate to achieve a manganese concentration of from about 2.0% to about 3.6% by weight of manganese based on the amount of zinc sulfide to form a second admixture;

(g) heating the second admixture at a temperature of from about 750° C. to about 850° C. for about 1.5 to about 3 hours to form an activated material containing from about 0.7% to about 1.3% by weight of manganese;

(h) washing the activated material with acetic acid, hydrochloric acid and potassium cyanide aqueous solutions to remove residual fluxes and excess activator materials; and

(i) drying the washed material to form an electroluminescent phosphor having increased brightness wherein the electroluminescent emission of the phosphor has an x color coordinate value of from about 0.522 to about 0.532 and a y color coordinate value of from about 0.460 to about 0.470 and the phosphor has an efficiency of greater than about 5.6 lumens per watt at 115 V/400 Hz and a particle size of from about 25 to about 30 micrometers.

5,009,809

HIGH TEMPERATURE ENDOTHERMIC BLOWING AGENTS COMPOSITIONS AND APPLICATIONS

John A. Kosin, Bel Air, Md.; Gerry Mooney, West Ajax, Canada; Michael A. Tarquini, Havre de Grace, Md., and Rod A. Garcia, Orange, Tex., assignors to J. M. Huber Corporation, Rumson, N.J.

Continuation-in-part of Ser. No. 352,307, May 16, 1989. This application Jan. 19, 1990, Ser. No. 467,584

Int. Cl.[5] C09K *3/00*

U.S. Cl. 252—350 **10 Claims**

1. A high temperature endothermic blowing agent which comprises a mixture of a polycarboxylic acid and a magnesium carbonate, wherein said polycarboxylic acid and said magnesium carbonate have been surface treated with a component selected from the group consisting of mono glycerides, stearic acid, silane coupling agents and mixtures thereof which prevents water from being absorbed by said polycarboxylic acid and said magnesium carbonate.

5,009,810

ENDOTHERMIC BLOWING AGENTS COMPOSITIONS AND APPLICATIONS

Satish K. Wason, Bel Air, Md.; Gerry Mooney, Ajax, Canada; Claude R. Andrews, Md.; Michael E. Tarquini, Havre de Grace, both of Md.; John A. Kosin, Bel Air, Md., and Rod A. Garcia, Orange, Tex., assignors to J. M. Huber Corporation, Rumson, N.J.

Filed May 16, 1989, Ser. No. 352,307

Int. Cl.[5] C08J *9/08, 9/224*

U.S. Cl. 252—350 **11 Claims**

1. An endothermic blowing agent which comprises a mixture of a polycarboxylic acid and an inorganic carbonate, wherein said polycarboxylic acid and said inorganic carbonate have been surface treated with a component selected from the group consisting of mono glycerides, stearic acid, silane coupling agents and mixtures thereof which prevents water from being absorbed by said polycarboxylic acid and said inorganic carbonate.

5,009,811

CONDUCTING VARNISH COMPOSITION

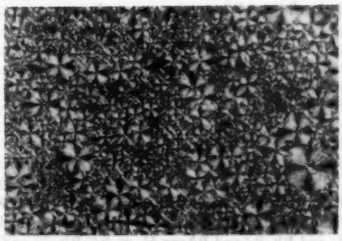
Tomio Nakamura, Ichikawa; Shigeru Shimizu, Yokohama, and Kikuko Takeuchi, Yokohama, all of Japan, assignors to Nitto Chemical Industry Company, Ltd., Tokyo, Japan

Filed Mar. 9, 1989, Ser. No. 321,284

Claims priority, application Japan, Mar. 16, 1988, 63-64399; Oct. 6, 1988, 63-250860

Int. Cl.[5] H01B *1/00*

U.S. Cl. 252—500 **17 Claims**



1. A conducting varnish composition consisting essentially of:

(a) 0.05–30% by weight of a tetracyanoquinodimethane complex salt;

(b) 0.05–100% by weight of a thermoplastic polymer or a monomer or oligomer which can polymerize into a polymer;

(c)

(i) 0.01–10% by weight of at least one member selected from the group consisting of acetals, orthoformic acid esters, orthoacetic acid esters, orthocarbonic acid esters, siloxanes, silyl ethers and orthosilicic acid esters; or

(ii) 0.001–20% by weight of a surfactant selected from the group consisting of anionic surfactants, cationic surfactants, amphoteric surfactants, nonionic surfactants, fluorine-containing surfactants and silicone oils; or

(iii) 0.01–11% by weight of a mixture of (i) and (ii), and

(d) a solvent wherein all percentages are based on the weight of the solvent.

5,009,812

ANTISTATIC AND ELECTRICALLY CONDUCTING POLYMERS AND MOULDING MATERIALS

Jürgen Finter, Freiburg/Br., Fed. Rep. of Germany; Bruno Hilti, Basel, Switzerland; Carl W. Mayer, Riehen, Switzerland; Ernst Minder, Basel, Switzerland, and Josef Pfeifer, Therwil, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Mar. 25, 1988, Ser. No. 172,880

Claims priority, application Switzerland, Apr. 3, 1987, 1284/87-0

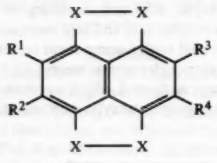
Int. Cl.[5] H01B *1/00*

U.S. Cl. 252—500 13 Claims

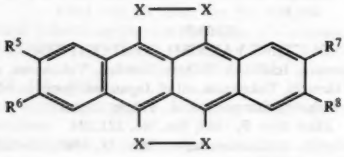
1. A composition containing

(a) a linear, branched or structurally crosslinked soluble polymer which is inert towards component (b) and

(b) a compound of the formula I or Ia or mixtures thereof

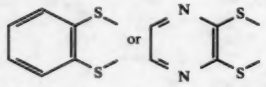


(I)



(Ia)

in which X is S, Se or Te, R^1, R^2, R^3 and R^4 independently of one another are a hydrogen atom or Cl or R^1 and R^2 and also R^3 and R^4 together are each



or R^1, R^2, R^3 and R^4 are each phenylthio, 4-methylphenylthio, 4-methoxyphenylthio or 4-pyridylthio, R^5, R^6, R^7 and R^8 independently of one another are H or F, R^5 is CH_3 and R^6, R^7 and R^8 are H, or R^5, R^6, R^7 and R^8 are CH_3, R^5 and R^6 are CH_3 or Cl, and R^7 and R^8 are H, or R^5 and R^6 are H, R^7 is —COR^9 and R^8 is H or —COR^9, or R^5 and R^6 are H and R^7 and R^8 together are —CO—O—CO or —CO—NR^{10}—CO— in which R^9 is halide, —OH, —NH_2 or the radical of an alcohol or a primary or secondary amine, or R^9 is OM in which M is a cation and R^{10} is H or the radical of a primary amine reduced by the NH_2 group, wherein the component (b) is present in an amount of 0.01 to 20% by weight, relative to the polymer.

10. A composition containing

(a) a linear, branched or structurally cross-linked soluble polymer and

(b) at least one charge-transfer complex (CT complex) which is composed of one compound of the formula I or Ia according to claim 1 and an electron acceptor, wherein the CT complex is present in an amount of 0.01 to 20% by weight, relative to the polymer and is in the form of a net-work of crystalline needles.

5,009,813

COMPOSITION FOR HAIR TREATMENT AGENT

Taichi Watanabe, Ichikawa; Hidekazu Ogino, Tokyo; Hajime Hirota, Tokyo; Tomohito Koshika, Tokyo; Naoko Moriya, Tokyo, and Toshio Nozaki, Sakura, all of Japan, assignors to Kao Corporation, Tokyo, Japan

Continuation of Ser. No. 122,454, Nov. 19, 1987, abandoned. This application Apr. 27, 1989, Ser. No. 344,443

Claims priority, application Japan, Nov. 28, 1986, 61-283745; Dec. 15, 1986, 61-297897; Dec. 16, 1986, 61-299673

Int. Cl.[5] C11D *1/02*

U.S. Cl. 252—545 3 Claims

1. A shampoo composition comprising as essential components:

(A) from 0.6 to 6% by weight of at least one chelating agent selected from the group consisting of α-aminoethane-α, α-diphosphonic acid, α-aminobenzyl-α, α-diphosphonic acid, amino-tri(methylene phosphonic acid), ethylene diamine tetra(methylene phosphonic acid), nitriloacetetic acid-di(methylene phosphonic acid), N,N-diacetic acid-N-methylene phosphonic acid, 1-hydroxyethane-1,1-diphosphonic acid, ethylenediamine tetraacetic acid, and nitrilo triacetic acid,

(B) from 0.1 to 5% be weight of at least one polymeric compound selected from the group consisting of cationic polymers containing quaternary nitrogen, and peptides of an average molecular weight of 400 to 10,000 or their derivatives, and

(C) from 5 to 30% by weight of at least one surface active agent selected from the group consisting of anionic and amphoteric active agents.

5,009,814

USE OF N-POLYHYDROXYALKYL FATTY ACID AMIDES AS THICKENING AGENTS FOR LIQUID AQUEOUS SURFACTANT SYSTEMS

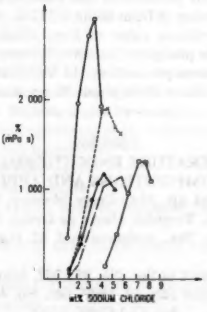
Heike Kelkenberg, Gladbeck; Wulf Ruback, Recklinghausen, and Klaus Engel, Duisburg, all of Fed. Rep. of Germany, assignors to Hüls Aktiengesellschaft, Marl, Fed. Rep. of Germany

Continuation of Ser. No. 149,479, Jan. 28, 1988, abandoned. This application Oct. 20, 1988, Ser. No. 262,257

Claims priority, application Fed. Rep. of Germany, Apr. 8, 1987, 3711776

Int. Cl.[5] C11D *3/32, 17/00*

U.S. Cl. 252—548 9 Claims



1. A method of shampooing which comprises:

(1) applying a mixture comprising at least one anionic or nonionic surfactant, water and 0.5–30 wt.% of an N-polyhydroxylalkyl fatty acid amide of formula

$$R_1-\underset{\underset{O}{\|}}{C}-\underset{\underset{X}{|}}{N}-R_2$$

wherein R_1 is a branched or straight chain C_{1-17} alkyl group; R_2 is hydrogen or a branched or straight chain C_{1-18} alkyl group or a group

$$-(CH_2-\underset{\underset{R_3}{|}}{CH}-O)_nH$$

wherein n is 0 to 5, R_3 is hydrogen or methyl; and X is a C_{4-7} polyhydroxyalkyl group.

5,009,815

COMPOSITION OF NONLINEAR OPTICAL MATERIALS AND A METHOD FOR PREPARING THE SAME

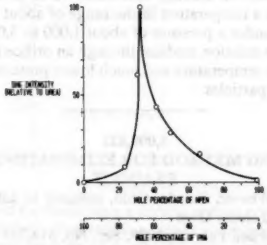
Katsuya Wakita, Moriguchi; Nobuo Sonoda, Settsu; Tokihiko Shimizu, Nara; Shu Hotta, Kawasaki, and Mamoru Soga, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Feb. 9, 1990, Ser. No. 478,230

Claims priority, application Japan, Feb. 22, 1989, 1-42389; Feb. 23, 1989, 1-43760; Mar. 30, 1989, 1-80359; May 16, 1989, 1-122187; May 16, 1989, 1-122188

Int. Cl.[5] F21V *9/00*; C09K *19/52*; G02B *5/23*

U.S. Cl. 252—582 **7 Claims**



1. A composition of nonlinear optical materials comprising:

a first organic compound with a π-electron conjugated system containing an electron-donative substituent group and an electron-attractive substituent group; and

a second organic compound of the general formula:

$$R_1-N(R_2)-R_3-N(R_2)-R_1 \quad (I)$$

wherein each R_1 is independently selected from the group consisting of hydrogen, amino, substituted amino, hydroxy, alkoxy, linear or branched alkyl, nitro, cyano, halogen, sulfonyl, carbonyl, acyl, alkoxycarbonyl, and unsubstituted or substituted aromatic or heterocyclic rings, with the proviso that at least one R_1 is an unsubstituted or substituted aromatic or heterocyclic ring; each R_2 is independently selected from the group consisting of hydrogen, amino, substituted amino, hydroxy, alkoxy, linear or branched alkyl, nitro, cyano, halogen, sulfonyl, carbonyl, acyl, and alkoxycarbonyl; and R_3 is a linear or branched alkylene group.

5,009,816

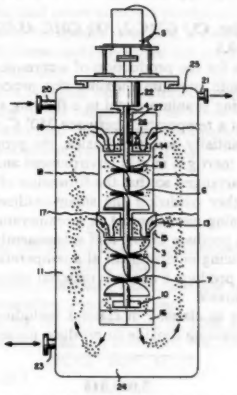
BROAD LIQUID LEVEL GAS-LIQUID MIXING OPERATIONS

Mark K. Weise, North Haledon, N.J.; Jeffery P. Kingsley, Newburgh, and Lawrence M. Litz, Pleasantville, both of N.Y., assignors to Union Carbide Industrial Gases Technology Corporation, Danbury, Conn.

Filed Apr. 26, 1990, Ser. No. 514,937

Int. Cl.[5] B01F *3/04*

U.S. Cl. 261—21 **12 Claims**



1. An improved process for mixing a gas and a liquid in a mixing vessel under circumstances in which the depth of said liquid changes over the course of the mixing operation comprising:

(a) introducing feed gas to the overhead gas space in a mixing vessel having two or more impeller-draft tube assemblies stacked vertically therein, each such assembly comprising a hollow draft tube with axial flow, down-pumping impeller means positioned therein for vortex development and the ingestion of gas from said overhead gas space into a body of liquid present in said mixing vessel, the lowest positioned impeller-draft tube assembly being positioned below the lowest liquid level encountered during the gas-liquid mixing operation, the highest positioned impeller-draft tube assembly being positioned below the highest liquid level encountered during said mixing operation, each next lower draft tube being positioned sufficiently below the draft tube above it so as to create a flow space between the draft tubes to allow the flow of liquid to said next lower impeller-draft tube assembly;

(b) rotating said impeller means to create a circulation of liquid downward in the lowest impeller-draft tube assembly, and in higher assemblies as the level of liquid rises in the mixing vessel, said liquid being discharged from the lowest assembly for passage upward in the annular space between said assemblies and the wall of the mixing vessel, thereby creating a vortex development and resulting ingestion of gas from the overhead gas space into the body of recirculating liquid; and

(c) controlling the flow of liquid to facilitate the passage of liquid from said annular space into the flow space between adjacent draft tubes and to preclude the radial expulsion of liquid being discharged from a higher draft tube away from the inlet to the next lower draft tube, the discharge flow from an upper draft tube thus serving as the feed to the next lower draft tube, whereby gas ingestion occurs by vortex entrainment at the inlet of the lowest draft tube when the liquid level is at its lowest point, with liquid pumping, gas dispersion and mixing being accomplished with the impeller means in said lowest draft tube, with said

stacked impeller-draft tube assemblies enabling said gas ingestion, gas dispersion, liquid pumping and mixing to be accomplished effectively as the liquid level changes during said gas-liquid operation.

5,009,817

URANIUM DIOXIDE PRODUCTION

Graham Hodgson, Blackpool, United Kingdom, assignor to British Nuclear Fuels plc, Warrington, England

Filed Jul. 11, 1989, Ser. No. 378,983

Claims priority, application United Kingdom, Sep. 9, 1988, 8821192

Int. Cl.[5] G21C *21/00*; C01G *43/02*

U.S. Cl. 264—0.5 12 Claims

1. A process for the production of a ceramic material comprising sinterable uranium dioxide, the process comprising initially oxidizing uranium metal in a flowing steam/inert gas environment at a temperature between 250° C. and 500° C. to produce substantially uranium dioxide, the proportions of the steam and the inert gas in said environment and the flow rate thereof being arranged so that the formation of U_3O_8 is inhibited, then further oxidizing the steam-oxidized metal in an oxygen-containing environment at a temperature not exceeding 700° C. to produce U_3O_8, and subsequently reducing the U_3O_8 in a reducing environment at a temperature not exceeding 600° C. to produce a ceramic material comprising sinterable uranium dioxide.

9. A process as claimed in claim 1 including subsequently sintering the uranium dioxide to produce nuclear fuel pellets.

5,009,818

METHOD OF MANUFACTURING AN OPTICAL INFORMATION RECORDED DISC

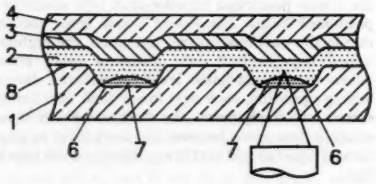
Yuji Arai; Yuaki Shin; Takashi Ishiguro, and Emiko Hamada, all of Tokyo, Japan, assignors to Taiyo Yuden Co., Ltd., Tokyo, Japan

Filed Nov. 7, 1989, Ser. No. 433,675

Claims priority, application Japan, Dec. 30, 1988, 63-335344

Int. Cl.[5] B29C *39/20, 45/16*

U.S. Cl. 264—1.003 21 Claims



16. A method for manufacturing an optical information recorded disc having an information stored therein and reproducible by an optical means, the method comprising the steps of:

(a) preparing a discoidal light-transmitting substrate having tracking guide means on one surface;

(b) forming a light-absorbing layer on the surface of the light-transmitting substrate, wherein an optical parameter represented by $\rho = n_{abs} d_{abs} \lambda$, where n_{abs} is the real part of the complex refractive index of the light-absorbing layer, d_{abs} is the thickness of the light-absorbing layer and λ is the wavelength of a reading laser beam, is $0.05 \leqq \rho \leqq 0.6$, and the imaginary k_{abs} of the complex refractive index of the light absorbing layer is at most 0.3;

(c) forming a light-reflecting layer on the light-absorbing layer;

(d) forming a protective layer on the light-reflecting layer; and

(e) irradiating the light-absorbing layer through the light-transmitting substrate and along the tracking guide means with a laser.

5,009,819

TASTE MODERATING COMPOSITION

Mircea C. Popescu, Plainsboro, and Edgar T. Mertz, Princeton, both of N.J., assignors to The Liposome Company, Inc., Princeton, N.J.

Filed Nov. 12, 1987, Ser. No. 119,667

Int. Cl.[5] B01J *13/02, 13/04*

U.S. Cl. 264—4.1 1 Claim

1. A method of making palatable an unpalatable hydrophobic therapeutic agent for oral administration which comprises:

forming liposomes in the presence of said hydrophobic agent, a solvent and a hydrophilic flavoring agent, to encapsulate a portion of said hydrophobic agent

separating said liposomes from unencapsulated agent and solvent by multiple washing and centrifuging steps that remove exogenous flavoring agent from said liposomes but do not reduce the stability of the liposomes and

adding a pharmaceutical carrier to said liposomes for oral administration.

5,009,820

PROCESS OF MAKING ACICULAR PARA-ARAMIDE PARTICLES

Don M. Coates, Midlothian, Va., and Patrick H. Young, Circleville, Ohio, assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 5, 1990, Ser. No. 489,274

Int. Cl.[5] B29B *9/00*; C08G *69/32*

U.S. Cl. 264—13 2 Claims

1. A process for preparing para-aramide particles by the steps of:

forming a solution medium of about 5 to 10% by weight poly(paraphenylene terephthalamide), about 15 to 25% by weight carbon dioxide, and about 70 to 85% by weight water at a temperature in the range of about 275° to 325° C. and under a pressure of about 1,000 to 3,000 psi, and

passing the solution medium through an orifice into a region of lower temperature and much lower pressure to precipitate the particles.

5,009,821

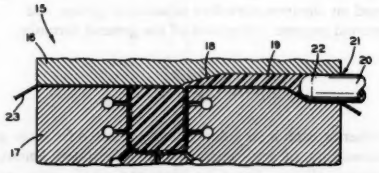
MOLDING METHOD FOR ELIMINATING FIBER READOUT

William R. Weaver, Toledo, Ohio, assignor to Libbey-Owens-Ford Co., Toledo, Ohio

Filed Feb. 23, 1989, Ser. No. 314,767

Int. Cl.[5] B29C *45/14*

U.S. Cl. 264—22 22 Claims



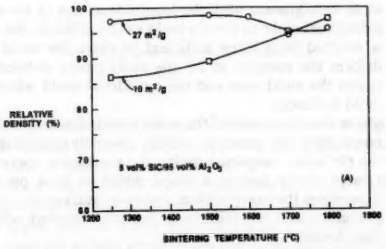
1. A process for preparing a fiber reinforced molded plastic article, comprising the steps of:

(A) providing a mold, including at least two cooperating mold sections, having a cavity therein for forming the fiber reinforced molded plastic article, wherein at least a portion of the mold cavity defines a mold cavity surface adjacent which a finished surface of the plastic article is to be molded;

(B) disposing a surface finishing film across the mold cavity surface;

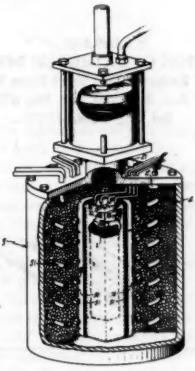
(C) conforming the surface finishing film to substantially the configuration of the mold cavity surface;
(D) positioning a fiber preform into the mold cavity having the surface finishing film conformed to the surface thereof, the fiber preform having substantially the same configuration as the mold cavity;
(E) closing the mold;
(F) injecting polymeric precursor materials into the mold cavity behind the surface finishing film, wherein the polymeric precursor materials fill the mold cavity and simultaneously:
(i) impregnate the fiber preform to form a molded fiber preform; and
(ii) deform the surface finishing film into intimate contact with the mold cavity surface; and
(G) curing the polymeric materials inside the mold, thus allowing the surface finishing film to maintain intimate contact with the mold surface while bonding the surface finishing film of the molded fiber preform;
whereby the surface finishing film provides a finished surface, whose outside shape matches the inside of the mold surface, and is free from fiber readout, on the fiber reinforced molded plastic article.

5,009,822
ALUMINA-OR ALUMINA/ZIRCONIA-SILICON CARBIDE WHISKER CERAMIC COMPOSITES AND METHODS OF MANUFACTURE
Michael D. Sacks, and Hae-Weon Lee, both of Gainesville, Fla., assignors to University of Florida, Gainesville, Fla.
Filed Jul. 17, 1989, Ser. No. 380,285
Int. Cl.[5] C04B *33/34*
U.S. Cl. 264—23 **17 Claims**



1. A method for fabricating a ceramic article comprising SiC whiskers uniformly dispersed in a matrix consisting of Al_2O_3 or a homogeneous mixture of Al_2O_3 and ZrO_2, said article containing from about 5 to 27 vol. % of SiC whiskers and having no less than about 93% of theoretical density, said method consisting of the steps:
(a) subjecting SiC whiskers to an acid- and/or base-washing step for a period of time sufficient to remove leachable impurities therefrom and to improve the dispersibility thereof in water, followed by washing with water to remove said acid and/or base therefrom,
(b) subjecting powdered Al_2O_3, or powdered Al_2O_3 and powdered ZrO_2, and SiC whiskers to fluid classification to remove coarse particles and agglomerates of said powdered Al_2O_3, or powdered Al_2O_3 and powdered ZrO_2i and SiC whiskers and provide powdered Al_2O_3 or powdered Al_2O_3 and powdered ZrO_2, having a specific surface area of at least about 8 m^2/g and having more than about 98% of the particles with equivalent Stokes diameters less than about 1.0 μm and SiC whiskers having a specific surface area of at least about 3 m^2/g and an average aspect ratio of from about 14 to about 21,
(c) forming a suspension of said powdered Al_2O_3, or powdered Al_2O_3 and powdered ZrO_2, and said SiC whiskers produced in step (b) in water at a pH of between about 3.5 and about 4.5 to provide zeta potentials therein of from about 40–70 mV and a solution conductivity from about 0.5–5 millimhos/cm employing a dispersing agent, said suspension having a solids concentration ≧ about 40 vol. %,
(d) consolidating said suspension produced in step (c) to form a green compact comprising a uniform dispersion of SiC whiskers in a homogenous microstructure comprising Al_2O_3 or a mixture of Al_2O_3 and ZrO_2, said green compact having a high relative packing density of from about 66 to about 71% and uniform pores and channels having median pore channel radii ≦about 50 nm,
(e) infiltrating said green compact produced in step (d) with an aluminum compound which is a precursor to Al_2O_3 and which forms α-Al_2O_3 under the conditions of sintering in step (f), and
(f) pressureless sintering said infiltrated green compact at a temperature in the range of from about 1250° to about 1800° C. in an inert atmosphere for a period of time sufficient to produce said ceramic article.

5,009,823
METHOD OF MOLDING A CARBON-CARBON COMPOSITE
Robert V. Kromrey, Campbell, Calif., assignor to United Technologies Corporation, Hartford, Conn.
Continuation of Ser. No. 907,942, Sep. 10, 1986, abandoned. This application Aug. 27, 1990, Ser. No. 574,554
Int. Cl.[5] B29C *43/10*
U.S. Cl. 264—29.7 **6 Claims**



1. A method for making a carbon-carbon composite comprising:
(a) disposing a resin impregnated carbon fiber reinforced prepreg in a pressure vessel;
(b) substantially filling said pressure vessel with a solid flowable particulate polymer;
(c) exposing said prepreg to temperatures and pressures sufficient to cure said prepreg to form a carbon-carbon precursor;
(d) exposing said carbon-carbon precursor to temperatures and pressures sufficient to post-cure said carbon-carbon precursor; and
(e) exposing said post-cured carbon-carbon precursor to temperatures and pressures sufficient to carbonize said post-cured carbon-carbon precursor to form a carbon-carbon composite;
wherein said curing, postcuring, and carbonization is a continuous process and said carbon-carbon composite has high strength.

5,009,824

PROCESS FOR PREPARING AN ASYMMETRICAL MACROPOROUS MEMBRANE POLYMER

Axel Walch, Frankfurt am Main; Juergen Wildhardt, Huenstetten, and Dieter Beissel, Wiesbaden, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 111,700, Oct. 23, 1987, abandoned, which is a division of Ser. No. 448,764, Dec. 10, 1982, Pat. No. 4,720,343. This application Oct. 23, 1989, Ser. No. 425,446

Claims priority, application Fed. Rep. of Germany, Dec. 17, 1981, 3149976

Int. Cl.[5] B01D *71/68, 69/12*

U.S. Cl. 264—45.1 12 Claims

1. A process for preparing an asymmetrical macroporous membrane, comprising the steps of:

(A) forming a macroporous asymmetrical membrane from a polymer solution by action of a coagulating liquid, said polymer solution comprising as the dissolved fraction a polymeric mixture comprised of about 5–70% by weight of polyvinylpyrrolidone having a molecular weight of ≧100,000 Dalton and about 95–30% by weight of a polymer selected from the group consisting of a polysulfone, a polyether sulfone, and an aromatic or araliphatic polyamide, said weight being relative to the total weight of the dissolved polymeric fraction, wherein coagulation is effected under conditions such that skin formation, asymmetrical pore formation and retention of said polyvinylpyrrolidone are achieved and

(B) recovering the resultant asymmetrical macroporous membrane comprising said polymeric mixture.

5,009,825

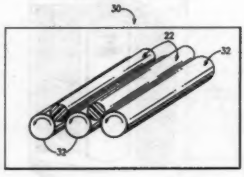
PRODUCTION OF EXTRUDED ROUND ROD

Mark Lurie, 3115 Embassy Dr., West Palm Beach, Fla. 33401

Filed Jun. 30, 1989, Ser. No. 375,149

Int. Cl.[5] B29C *47/90*

U.S. Cl. 264—148 16 Claims



1. In a method of producing a round rod formed of thermoplastic material by extrusion in a conventional extruder, the improvement which comprises the steps in sequence of:

A. cooling the extruded rod as it is expressed from the extruder;

B. cutting the extruded rod to a predetermined length;

C. heating the cut extruded rod from step B to a temperature above the glass transition temperature of the rod while rotating the rod fully supported on roller means; and

D. cooling the heated rod from step C at a controlled rate while rotating the rod fully supported on said roller means.

9. Apparatus for producing round rod formed of thermoplastic material, comprising an extruder for forming a round rod, and a post-extrusion heat treating means comprising an oven containing a plurality of rollers having axis parallel to one another for rotating and fully supporting said rod with the axis of the rod parallel to the axis of said rollers for a predetermined period of time.

5,009,826

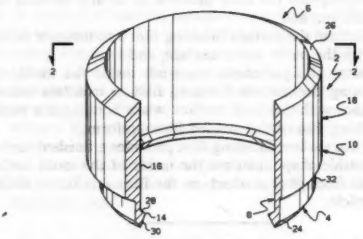
METHOD OF MOLDING A COMPOSITE DRILL COLLAR

John H. Walker, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 90,287, Aug. 28, 1987, Pat. No. 4,832,137, which is a division of Ser. No. 868,409, May 9, 1986, Pat. No. 4,708,203. This application May 1, 1989, Ser. No. 345,914

Int. Cl.[5] B29C *43/04*

U.S. Cl. 264—154 2 Claims



1. A method for molding a collar for use on a drill string which comprises:

heating a sheet of thermoplastic material, containing long fiber reinforcement, to the softening point;

rolling the reinforced thermoplastic sheet into a roll having a cylindrical shape;

placing the roll in an open cylindrical mold having a longitudinal axis so that the longitudinal axis of the roll is approximately coaxial with the longitudinal axis of the open cylindrical mold;

inserting a mold core having a longitudinal axis into the mold in alignment with the longitudinal axis of the open cylindrical mold to form a mold cavity wherein the core is inserted with force sufficient to close the mold and deform the material to fill the mold cavity defined between the mold core and the cylindrical mold when the mold is closed;

wherein the lower end of the mold core is beveled to form one surface of a generally radially inwardly extending rib, the rib being completed during the machining operation;

the mold cavity having a shape which at least partially determines the inner surface and outer surface of a collar precursor, and wherein the precursor is formed with an end closure;

cooling the thus formed collar precursor;

opening the mold;

removing the collar precursor from the mold; and

machining the end surfaces of the collar precursor in a machining operation to remove the end closure and form the collar which is suitable for use on a drill string.

5,009,827

PROCESS FOR FORMING AN ELASTOMERIC MEMBRANE

Ismat A. Abu-Isa, Rochester; Elio Eusebi, Troy; Craig B. Jaynes, Bloomfield Hills; Susan C. Moran, Ann Arbor, and Michael A. Roy, Troy, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 119,965, Nov. 13, 1987, Pat. No. 4,842,257. This application Nov. 14, 1988, Ser. No. 271,461

Int. Cl.[5] B29D *7/01*

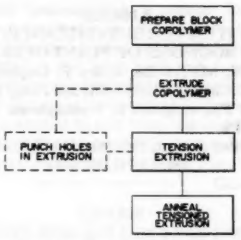
U.S. Cl. 264—156 4 Claims

1. A process for forming a vehicle seat suspension component comprising the steps of:

extruding a quantity of unoriented block copolymer material of polytetramethylene terephthalate polyester and polytetramethylene ether into a membrane;

tensioning said membrane to orient molecules therein with respect to the extrusion direction of the membrane;

annealing the membrane to set the orientation of the molecules so that the membrane has a first modulus of elasticity in a first range of elongation of the copolymer material



and a second modulus of elasticity greater than the first modulus in a second range of elongation which is greater than the first range of elongation.

5,009,828

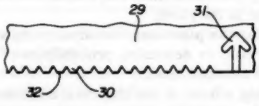
METHOD OF FORMING A RECLOSABLE CONTAINER WITH GRIP STRIP

John O. McCree, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 781,125, Sep. 26, 1985, abandoned. This application Oct. 11, 1989, Ser. No. 419,975

Int. Cl.[5] B29C *47/12*

U.S. Cl. 264—177.1 **7 Claims**



1. A method of forming a reclosable container with gripping ridges formed in a grip strip on opposed lips of the container, said method comprising the steps of

forming three or more cut-away sections on an extrusion die adapted to form ridges on film coextruded adjacent said ridges, said cut-away sections spaced a distance so that there are at least seven ridges per lineal inch in the width of said grip strip, said cut-away sections shaped so as to present a gripping edge on said ridges,

extruding said ridges through said extrusion die onto a plastic film to form said grip strip, and

drawing down said grip strip so as to maintain generally said gripping edge and said at least seven ridges per lineal inch of said grip strip.

5,009,829

PROCESS FOR MANUFACTURING YARNS BY MELTSPINNING POLYETHYLENE TEREPHTHALATE

Antonius Roos, Veenendaal, Netherlands, assignor to Akzo N.V., Arnhem, Netherlands

Continuation-in-part of Ser. No. 169,222, Mar. 16, 1988, abandoned. This application Jun. 29, 1989, Ser. No. 372,763

Claims priority, application Netherlands, Mar. 16, 1987, 8700617

Int. Cl.[5] D01F *6/62*

U.S. Cl. 264—210.6 **8 Claims**

1. A process for manufacturing industrial yarns by melt-spinning polyethylene terephthalate (PETP), comprising, in one operation, melting solid PETP, extruding the molten PETP through spinning orifices and solidifying the extruded PETP into a spun product which is drawn into a yarn, wherein:

(a) the solid PETP has a relative viscosity in the range of 1.8 to 2.1;

(b) before extruding, the PETP is mixed with 0.1–0.8% by weight of a bis-(ketenimine);

(c) the molten PETP is drawn off from the spinning orifices at a speed in the range of 1500 to 4000 m/min; and

(d) the spun product formed is drawn without intermediate winding at a draw ratio of 1.5 to 4.0, the draw ration being selected such that the final speed of the yarn is not higher than 6000 m/min;

thereby producing industrial yarn at a speed not higher than 6000 m/min having an elongation at break of from about 9% to about 18%.

5,009,830

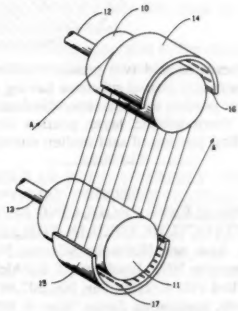
ON-LINE FIBER HEAT TREATMENT

Terry S. Chern, Richmond, Va., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 20, 1989, Ser. No. 326,553

Int. Cl.[5] D01F *6/60*; D01D *10/02*

U.S. Cl. 264—290.5 **9 Claims**



1. A process for simultaneously drying and heat treating under tension wet spun fibers comprising:

(a) supplying continuously by means of a pair of fiber carrying rolls to a heated zone fibers of greater than 20 percent water based on weight of dry fiber material;

(b) conducting the fibers in the heated zone in multiple wraps around the pair of rolls;

(c) maintaining a tension of 0.2 to 6 grams per denier to the fibers at the beginning of the zone;

(d) directing turbulent gas at a temperature of 200 to 600° C. by means of gas jets extending around each of the rolls for about 45 to 180° against the fibers under tension in the zone until the residual moisture in the fibers is from 0.5 to 10 percent water based on weight of dry fiber material;

(e) removing continuously the fibers from the heated zone.

5,009,831

EXTRUSION COATED SUBSTRATES WITH SEPARABLE AND REMOVABLE LAYERS

Eran Turi, Springfield, Mass., assignor to Union Camp Corporation, Wayne, N.J.

Filed Jun. 9, 1989, Ser. No. 363,828

Int. Cl.[5] B29C *47/06*

U.S. Cl. 264—510 **15 Claims**

1. A process for extrusion coating a substrate with a thermoplastic layer which is separable from said substrate, comprising:

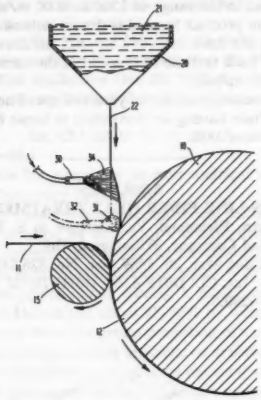
(a) directing said substrate between two pressure roll means, a first of said pressure roll means having a temperature of less than the melting point of said thermoplastic;

(b) providing a molten curtain of said thermoplastic;

(c) directing said molten curtain of said thermoplastic with a current of a fluid medium so as to cause at least a first

portion of said molten curtain to contact said first pressure roll means for a time sufficient to substantially solidify said first portion to form a thermoplastic sheet; and

(d) combining at least said thermoplastic sheet with said



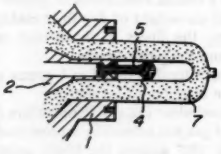
substrate between said two pressure roll means so as to form an extrusion coated substrate having a first thermoplastic layer portion which is separable from said substrate said first thermoplastic layer portion comprising said solidified first portion of said molten curtain.

5,009,832

CLOSED END SLEEVE PRODUCING METHOD AND CORE STRUCTURE USED IN THE METHOD

Shinji Oshima, Ama, and Hidenobu Misawa, Nagoya, both of Japan, assignors to NGK Insulators, Ltd., Aichi, Japan

Filed Feb. 8, 1989, Ser. No. 307,497
Claims priority, application Japan, Mar. 4, 1988, 63-51218
Int. Cl.[5] B29C *69/00*
U.S. Cl. 264—571 **7 Claims**



5. A method for producing a sleeve having a closed end by extruding a forming material from a mouthpiece, sequentially comprising the steps of:

arranging a core member at a position in said mouthpiece, said core member having at its outer end a tip die made of a porous body for forming an inner configuration of said closed end;

arranging an outer die made of a porous body at the outer end of said mouthpiece for forming an outer configuration of said closed end, thereby providing an annular space defined by the mouthpiece, the core member and the outer die;

supplying said forming material into the annular space and extruding the material therefrom, while simultaneously applying suction to said outer die made of the porous body from an outside portion thereof, thereby forming the closed end of said sleeve;

removing said outer die from the mouthpiece by blowing air through the outer die from its outside portion and against the formed closed end of said sleeve; and

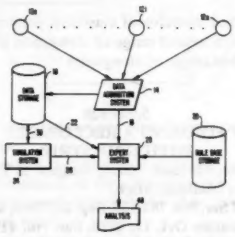
supplying air through said tip die into a volume between the formed closed end of said sleeve and said tip die, while simultaneously further supplying said forming material into said annular space to extrude the material from said mouthpiece.

5,009,833

EXPERT SYSTEM FOR SURVEILLANCE, DIAGNOSIS AND PROGNOSIS OF PLANT OPERATION

Kenji Takeuchi, Murrysville; Andre F. Gagnon, Monroeville; Augustine C. Cheung, Murrysville, and Philip E. Meyer, Penn Hills, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 11, 1989, Ser. No. 295,698
Int. Cl.[5] G21C *7/36*
U.S. Cl. 376—217 **14 Claims**



1. A method for analyzing operating conditions in a plant, comprising the steps of:

(a) obtaining plant condition data indicative of the operating conditions in the plant;

(b) evaluating the plant condition data using an expert system rule base to determine probabilities of existence of abnormal circumstances;

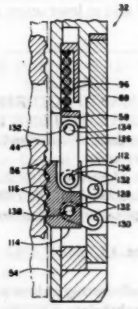
(c) predicting effects of the abnormal circumstances in dependence upon the plant condition data.

5,009,834

CURVILINEAR TRANSLATING LATCH AND LINKAGE ARRANGEMENT IN A CONTROL ROD DRIVE MECHANISM OF A NUCLEAR REACTOR

John E. Tessaro, Manor Boro, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 14, 1990, Ser. No. 567,026
Int. Cl.[5] G21C *7/12*
U.S. Cl. 376—232 **10 Claims**



1. A latch and linkage arrangement in a control rod drive mechanism of a nuclear reactor, said arrangement comprising:

(a) at least one latch including an elongated body having a

pair of opposite ends and a pair of opposite side edges, and a plurality of latch teeth defined along one of said side edges of said body between said opposite ends thereof; and

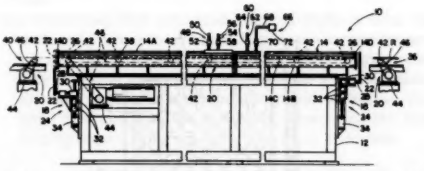
(b) a plurality of links, a first of said links pivotally connected to said latch body adjacent one of said ends thereof and pivotally connectable to a member for applying a motive force longitudinally of said body between said opposite ends thereof, second and third of said links pivotally connected to said latch body and connectable to a support member in parallel relation to one another so as to define a parallelogram therewith such that when the motive force is applied to said body via said first link said latch body and thereby said latch teeth undergo curvilinear movement toward and away from a latching position.

5,009,835

NUCLEAR FUEL ROD HELIUM LEAK INSPECTION APPARATUS AND METHOD

Hassan J. Ahmed, Irmo, S.C., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 25, 1989, Ser. No. 301,414
Int. Cl.[5] G21C *17/00*
U.S. Cl. 376—251 **21 Claims**



1. An inspection apparatus for testing nuclear fuel rods for helium leaks, comprising:

(a) a test chamber being openable and closable for receiving at least one nuclear fuel rod;

(b) means separate from the fuel rod for supplying helium and constantly leaking helium at a predetermined known positive value into said test chamber to constantly provide an atmosphere of helium at said predetermined known positive value in said test chamber; and

(c) means for sampling the atmosphere within said chamber and measuring the helium in the atmosphere such that a measured helium value (i) below a preset minimum helium value substantially equal to said predetermined known positive value of said atmosphere of helium being constantly provided in said test chamber indicates a malfunction in said inspection apparatus, (ii) above a preset maximum helium value greater than said predetermined known positive in said test chamber indicates the existence of a helium leak from the fuel rod, or (iii) between said preset minimum and maximum helium values indicates the absence of a helium leak from the fuel rod.

5,009,836

METHOD FOR TEMPORARY SHIELDING OF REACTOR VESSEL INTERNALS

Noel P. Grimm, Monroeville, and James Sejvar, Murrysville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 19, 1989, Ser. No. 368,433
Int. Cl.[5] G21C *19/00, 11/00*
U.S. Cl. 376—260 **6 Claims**

3. A method for shielding stored internals for reactor vessel annealing, comprising the steps of:

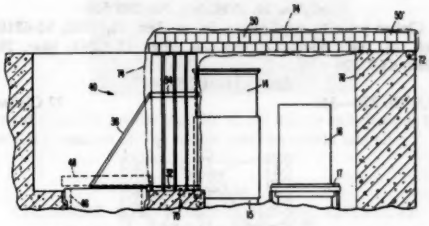
(a) removing nuclear fuel from the reactor vessel containment building;

(b) removing and storing upper and lower core internals under water in a refueling canal storage area;

(c) assembling a support structure in the refueling canal between the reactor vessel and the stored internals;

(d) introducing a plurality of vertical shielding tanks individually through a hatch in the containment building and positioning each into the support structure;

(e) introducing a plurality of horizontal shielding tanks individually through a hatch in the containment building and



positioning each above the stored internals and plurality of vertical tanks;

(f) draining water from the refueling canal to the level of a flange of the reactor vessel;

(g) placing an annealing apparatus in the reactor vessel;

(h) pumping the remaining water from the reactor vessel; and

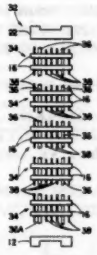
(i) annealing the reactor vessel.

5,009,837

AXIALLY MODULAR FUEL ASSEMBLY AND ROD FOR OPTIMAL FUEL UTILIZATION

Tho Q. Nguyen, Penn Township, Westmoreland County, and Alberto L. Casadei, Monroeville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 3, 1989, Ser. No. 431,355
Int. Cl.[5] G21C *3/32*
U.S. Cl. 376—261 **24 Claims**



1. A modular fuel assembly, comprising:

(a) a plurality of axially stacked end-to-end adjacent subassemblies;

(b) each of said subassemblies including a plurality of elongated structural segments, a plurality of fuel rod segments and at least one support grid mounted to said structural segments and supporting said fuel rod segments; and

(c) means defined on opposite ends of said structural segments for releasably connecting together in axially aligned end-to-end relation said structural segments of said respective adjacent subassemblies to form a plurality of elongated structural support members for providing a structural skeleton of said modular fuel assembly with said support grids of said respective adjacent subassemblies disposed in axially spaced relation relative to one another along said structural support members and said fuel rod segments of said respective adjacent subassemblies dis-

posed in axially aligned end-to-end relation with each other.

5,009,838

INTERNAL PUMP FOR NUCLEAR REACTOR

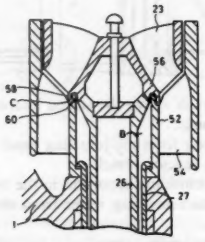
Tsutomu Shioyama, Yokohama; Ko Minakami, Kawasaki; Takao Fujii, Yokohama, and Koichi Ohtomi, Kawasaki, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jan. 18, 1989, Ser. No. 298,596

Claims priority, application Japan, Jan. 18, 1988, 63-6816; Feb. 29, 1988, 63-44267; Mar. 28, 1988, 63-72061; Mar. 29, 1988, 63-73320

Int. Cl.[5] G21C *19/42*

U.S. Cl. 376—310 22 Claims



1. A nuclear reactor internal pump comprising:

a pump shaft connected to a motor and rotatably passing through the bottom of a nuclear reactor pressure vessel;

an impeller fitted to a front end portion of the pump shaft;

a diffuser disposed on the downstream side of the impeller and having an inner cylinder fixed to the bottom of the reactor pressure vessel to surround the pump shaft;

a purge water passage defined between the pump shaft and the inner cylinder to communicate with the inside of the reactor pressure vessel;

a purge water supply means for supplying purge water to the reactor pressure vessel through the purge water passage; and

a clad dropping preventive means, located inside the reactor pressure vessel, for preventing clad from entering the pressure while allowing the purge water to pass through the passage.

5,009,839

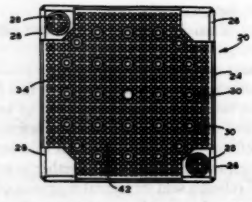
NUCLEAR FUEL ASSEMBLY BOTTOM NOZZLE PLATE

Raymond A. King, Lynchburg, Va., assignor to B&W Fuel Company, Lynchburg, Va.

Filed Sep. 4, 1990, Ser. No. 577,384

Int. Cl.[5] G21C *19/30, 3/30, 15/00*

U.S. Cl. 376—352 4 Claims



1. In a fuel assembly for a nuclear reactor, a bottom nozzle plate having legs adapted to be positioned on the lower core plate of the reactor for supporting the fuel assembly above coolant inlet openings in the core plate, said bottom nozzle plate comprising:

a. a rigid substantially square plate; and

b. said square plate having a plurality of first coolant flow holes therethrough where each of said first flow holes is circular in cross section and 0.180±0.005 inch in diameter with the majority of said first flow holes grouped in clusters of four to define a square pattern relative to the sides of said square plate such that the width of the sections of said square plate between said first flow holes in said square pattern is less than the width of the sections of said square plate between said clusters of four holes and said square plate having a plurality of second coolant flow holes therethrough positioned so as to be above the coolant inlet openings in the core plate when said bottom nozzle plate is installed in the reactor, with each of said second flow holes being of an irregular pattern to define a substantially clover leaf shape.

5,009,840

FUEL ASSEMBLY FOR NUCLEAR REACTOR

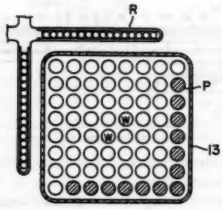
Makoto Ueda; Yoshihira Ando; Shungo Sakurai, and Ritsuo Yoshioka, all of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jan. 19, 1989, Ser. No. 299,238

Claims priority, application Japan, Jan. 23, 1988, 63-11872; Mar. 22, 1988, 63-65735; Apr. 1, 1988, 63-78080

Int. Cl.[5] G71C *3/32*

U.S. Cl. 376—435 11 Claims



1. A fuel assembly for a nuclear reactor having a number of fuel rods arranged in a channel box surrounded by a water gap, comprising:

a plurality of first fuel rods arranged in a peripheral portion of said channel box which faces a water gap through which a control blade is not inserted or drawn out; and

a plurality of second fuel rods arranged in portions of the channel box other than said peripheral portion and each containing a fissionable material having an atomic number density larger than that of a fissionable material contained in each of said first fuel rods.

5,009,841

PROCESS FOR DEWAXING INJECTION MOLDED METAL PIECES AND FOR IMPROVING THE PROPERTIES THEREOF

Martin Bloemacher, Meckenheim; Reinhold Schlegel, Hassloch, and Dieter Weinand, St. Martin, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Apr. 12, 1990, Ser. No. 508,190

Claims priority, application Fed. Rep. of Germany, Apr. 14, 1989, 3912298

Int. Cl.[5] B22F *100*

U.S. Cl. 419—23 5 Claims

1. A process for preparing injection molded metal pieces, which process comprises: mixing finely divided iron and from 2 to 30% by weight of a finely divided oxide of iron to produce a iron/iron oxide mixture; adding an organic binder with heating to the iron/iron oxide mixture to produce a iron/iron oxide binding mixture having a pasty consistency; cooling and granulating the iron/iron oxide/binder mixture to produce granules of the iron/iron oxide/binder; subjecting the granules to injection molding to form molded pieces of the iron/iron oxide/-

binder mixture; and heating the molded pieces under a reducing atmosphere to produce a molded piece containing iron free of iron oxide and free of binder.

5,009,842

METHOD OF MAKING HIGH STRENGTH ARTICLES FROM FORGED POWDER STEEL ALLOYS

Alfred A. Hendrickson, Lake Leelanau, and Darrell W. Smith, Chassell, both of Mich., assignors to Board of Control of Michigan Technological University, Houghton, Mich.

Filed Jun. 8, 1990, Ser. No. 535,379
Int. Cl.[5] B22F *3/24*
U.S. Cl. 419—28 **15 Claims**

1. A method for producing a high strength article from forged powder steel alloys comprising the steps of:

(a) compacting said powder into a coherent preform;

(b) heating said preform in a sintering means in a substantially dry, highly-reducing atmosphere and at a temperature of at least 1150° C. to sinter said preform and allowing said sintered preform to cool;

(c) preheating said sintered preform in a preheating means in the presence of a substantially dry, highly reducing atmosphere to a preheating temperature of at least 1000° C.; and

(d) transferring said preheated, sintered preform from the preheating means to an impact forging device and impacting said preform therein at a peak average forging pressure of at least about 1000 MPa to obtain a forged article, the time period between removing said preheated, sintered preform from the preheating means and the first forging impact being no more than about 8 seconds.

5,009,843

SPRING STEEL HAVING GOOD DURABILITY AND SAG-RESISTANCE

Atsushi Sugimoto; Osamu Nakano; Shigeru Yasuda; Chikatoshi Maeda; Toshio Ozone, and Makoto Kawagoe, all of Aichi, Japan, assignors to Aichi Steel Works, Ltd., Tokai; Toyota Jidosha Kabushiki Kaisha, Toyota and Chuo Hatsujo Kabushiki Kaisha, Nagoya, all of, Japan

Filed May 22, 1990, Ser. No. 526,893
Claims priority, application Japan, May 29, 1989, 1-135631
Int. Cl.[5] C22C *38/40*
U.S. Cl. 420—112 **4 Claims**

1. A spring steel having a good durability and a good sag-resistance consisting essentially of by weight 0.35–0.55% carbon, 1.80–3.00% silicon, 0.50–1.50% manganese, 0.50–3.00% nickel, 0.10–1.50% chromium, 0.01–0.05% aluminum and 0.010–0.025% nitrogen, the remainder being iron and inevitable impurities.

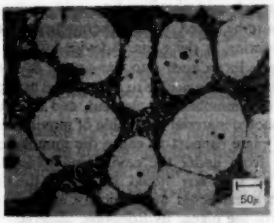
5,009,844

PROCESS FOR MANUFACTURING SPHEROIDAL HYPOEUTECTIC ALUMINUM ALLOY

Venkatasubramanian Laxmanan, Troy, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 1, 1989, Ser. No. 444,652
Int. Cl.[5] C22C *1/00, 1/02*
U.S. Cl. 420—548 **4 Claims**

1. A semi-solid metal-forming process for producing an article of a hypoeutectic aluminum-silicon alloy comprising between about 5 and 12 weight percent silicon, said process comprising heating a body of hypoeutectic aluminum-silicon alloy to a temperature between the liquidus temperature and the solidus temperature to initiate partial melting of the alloy and thereby to form a semi-solid body composed of a spheroidal phase dispersed in a liquid phase, said heating being carried



out at a rate not greater than 30° C. per minute and effective to inhibit formation of free silicon particles within said alloy.

5,009,845

CHEMICAL AGENT DETECTORS FOR CHEMICAL NERVE AGENTS

Dominique Thoraval, Candiac, and John W. Bovenkamp, Kanata, both of Canada, assignors to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence, Ontario, Canada

Continuation-in-part of Ser. No. 263,186, Oct. 27, 1988, abandoned. This application Dec. 5, 1989, Ser. No. 446,569
Claims priority, application Canada, Mar. 25, 1988, 562507
Int. Cl.[5] G01N *31/22*
U.S. Cl. 422—56 **18 Claims**

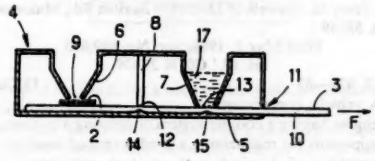
1. A chemical agent detector comprising a paper base including, impregnated in said base, a mixture of the dye 3',3'', 5',5''-tetrabromophenolphthalein ethyl ester (TBPE) and at least one dye selected from the group consisting of 4-[(phenylazo)phenyl)axo]-phenol (Disper Yellow 23) and p-ethoxyphenyl-azo-α-hydroxynaphthoic acid (PEN).

5,009,846

ONE-USE DEVICE FOR BIOLOGICAL TESTS

Louis Gavet, Lyon; Roger Chatelin, Lissieu Par; Michel Sotton, St Cyr Au Mont D'Or; Robert Guigal, Lyons, and Philippe Laurent, Oullins, all of France, assignors to Centre Technique Industriel dit: Institut Textile de France and Probiotec (SARL), both of, France

Filed Sep. 28, 1989, Ser. No. 413,857
Claims priority, application France, Oct. 11, 1988, 88 13668
Int. Cl.[5] G01N *21/00, 31/22*
U.S. Cl. 422—56 **13 Claims**



1. A unitary, one-use device for biological tests comprising:

(a) at least one element for immobilizing specific molecules contained in a liquid medium to be tested, wherein said immobilizing element is in the form of a hydrophilic material;

(b) a planar hydrophobic material on a surface of which is fixed said immobilizing element;

(c) a bottom plate supporting the planar hydrophobic material;

(d) at least one cavity for a liquid medium to be tested, said cavity having an outlet orifice situated above the planar hydrophobic material, and

(e) a scraping means situated above said planar hydrophobic material;

whereby said immobilizing element, said planar hydrophobic material, said bottom plate, said cavity for a liquid medium to be tested, and said scraping means are capable of interacting in the unitary device so that when liquid medium is introduced into the cavity, it exits the cavity through the outlet orifice to contact the hydrophilic material of the immobilizing element, and so that the planar hydrophobic material is capable of moving relative to the bottom plate support to cause the immobilizing element to pass from under the cavity and under the scraping means so that any liquid in or on the immobilizing element is extracted mechanically and moved over the surface of the planar hydrophobic material.

5,009,847

KIT FOR DETERMINING BLOOD PLATELET STRESS

Clive C. Solomons, 164 S. Fairfax, Denver, Colo. 80222

Division of Ser. No. 623,579, Jun. 22, 1984, Pat. No. 4,600,696. This application Mar. 27, 1986, Ser. No. 844,890

Int. Cl.[5] C12Q *1/56*; G01N *33/48*

U.S. Cl. 422—61 **10 Claims**

1. A kit for determining physical or chemical stress on blood platelets by measuring the relative concentration of adenosine tryphosphate, adenosine diphosphate, adenosine monophosphate and hypoxanthine in a sample of platelet-rich plasma containing an anticoagulant selected from the group consisting of heparin and a heparin salt which comprises:

at least one standard container containing known concentrations of at least one of adenosine triphosphate, adenosine diphosphate, adenosine monophosphate and hypoxanthine,

a second container containing a known concentration of an internal standard nucleotide and at least two sample containers coated with a composition that minimizes or prevents chemical or physical stress in blood platelets

a third container for a blood sample coated with an anticoagulant selected from the group consisting of heparin and a heparin salt, and nomogram shown in the Figure and defined by the algorithm

$$R = \frac{ATP + ADP}{AMP + HYPX}$$

5,009,848

ON BOARD AUTOMATIC DIESEL ENGINE COOLING WATER CHEMICAL TREATMENT DISPENSING SYSTEM

James M. Secretarski, 6910 Dorn Rd., Hartland, Wis. 53029, and Terry M. Crowell, W320 S8409 Bevllah Rd., Mukwonago, Wis. 53149

Filed May 2, 1988, Ser. No. 189,373

Int. Cl.[5] G01N *27/06*

U.S. Cl. 422—62 **13 Claims**

1. A vehicle, comprising:

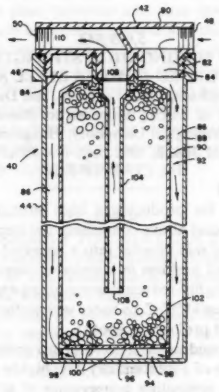
an engine having a cooling system circulating a coolant; and

an apparatus for maintaining a predetermined level of concentration of chemicals in the coolant, comprising:

sensing means for monitoring the level of concentration of chemicals in the coolant;

flow through chemical dispensing means interconnected with said cooling system; and

flow control means responsive to said sensing means for preventing the flow of coolant through said dispensing means when the level of concentration of chemicals is at or above said predetermined level, and for allowing coolant to circulate through said dispensing means and back into said cooling system when the level of concentration of chemicals in said system falls below said predetermined level, so as to raise the level of concentration of chemicals in said system to said predetermined level, whereafter said flow control means discontinues circulation of coolant through said dispensing



means in response to detection of said predetermined level of concentration of chemicals by said sensing means.

5,009,849

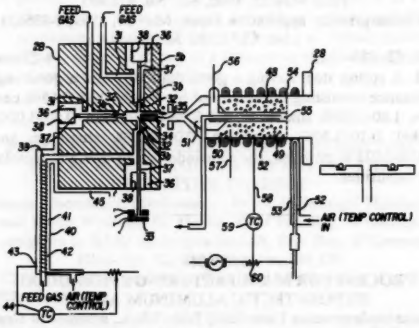
APPARATUS FOR CARRYING OUT CATALYZED CHEMICAL REACTIONS AND FOR STUDYING CATALYSIS

Jerry R. Ebner, and John T. Gleaves, both of St. Louis, Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 923,890, Oct. 28, 1986, abandoned, which is a continuation-in-part of Ser. No. 682,028, Dec. 14, 1984, Pat. No. 4,626,412. This application Jun. 28, 1989, Ser. No. 372,095

Int. Cl.[5] G01N *1/22*

U.S. Cl. 422—83 **21 Claims**



1. An apparatus capable of use for Temporal Analysis of Products comprising a gas processing system including means which are capable of use for Temporal Analysis of Products and a manifold for introduction of a plurality of gas streams into said gas processing system, the manifold comprising a plurality of inlet channels through which gas may flow toward said system, and a mixing chamber having inlet means in communication with said plurality of channels and a chamber outlet in communication with said system, at least one of said channels having a rapidly operable gas feed valve at the termi-

nus of the channel at which the channel communicates with said chamber inlet means, said mixing chamber having a void volume that is small relative to the working volume of the gas processing system so that the residence time of the process gases in said chamber is short compared to the residence time in said gas processing system.

5,009,850

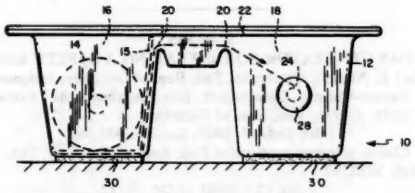
BLOOD CONTAINMENT DEVICE

Craig J. Bell, Winchester, N.H., assignor to Smiths Industries Medical Systems, Inc., Keene, N.H.

Continuation of Ser. No. 190,498, May 5, 1988, abandoned. This application May 4, 1990, Ser. No. 518,311

Int. Cl.[5] B01L *11/00*

U.S. Cl. 422—99 **6 Claims**



1. A blood containment device comprising:
a housing having means defining an opening;
a roll of absorbent material stored within said housing;
a tension plate, non-integral with said housing, located within said housing to help maintain said absorbent material taut beneath said opening; and
a take-up reel arranged within said housing so that said reel may be used to pull said absorbent material past the opening in said housing as said material is rolled onto said reel.

5,009,851

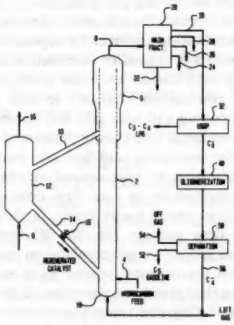
INTEGRATED CATALYTIC REACTOR SYSTEM WITH LIGHT OLEFIN UPGRADING

Amos A. Avidan, Yardley, and Sergei Yurchak, Media, both of Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 200,109, May 31, 1988, Pat. No. 4,966,680. This application Feb. 21, 1989, Ser. No. 312,272

Int. Cl.[5] B01J *8/18*

U.S. Cl. 422—141 **2 Claims**



1. An improved reactor system for fluidized bed catalytic cracking comprising:
a primary vertical riser cracking reactor operatively connected to receive hot regenerated catalyst at a bottom riser portion for upward passage through said vertical riser;
regenerator means connected in a regeneration loop for receiving catalyst from said primary cracking reactor;
first conduit means for feeding liquid oil under pressure to the bottom riser portion of the primary reactor;
second conduit means for feeding lift gas to the primary reactor below said first conduit means;
mixing means adapted for receiving and combining catalyst form the regeneration loop with the liquid oil and the lift gas;
fractionation means for recovering liquid cracking products and olefinic light crackate gas form the primary reactor;
secondary catalytic reactor means for contacting at least a portion of the olefinic light crackage gas with olefin upgrading catalyst to produce gasoline range liquid product and byproduct light hydrocarbon gas; and
means for recovering and recycling at least a portion of the byproduct light gas to the primary reactor as lift gas.

5,009,852

COOLED FLUIDIZATION GRID

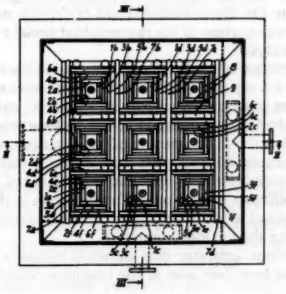
Jean-Claude Kita, Vermelles; Roger M. Puff, Lens; Alexandre Petrovic, Chatou, and Marcel Chretien, Morsang-sur-Orge, all of France, assignors to Charbonnages de France, Malmaison Cedex, France

Filed Dec. 8, 1988, Ser. No. 281,157

Claims priority, application France, Dec. 11, 1987, 87 17314

Int. Cl.[5] B01J *8/44*

U.S. Cl. 422—143 **6 Claims**



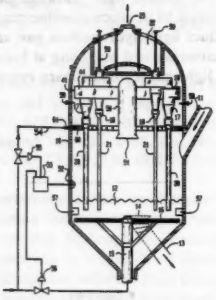
1. A grid for fluidizing a mass of finely divided material in a fluidized bed exothermal reactor, comprising:
a top face and a bottom face and a plurality of openings defined therethrough from said bottom face to said top face for admitting a gas for sustaining the material which is disposed over the top face of the grid,
said openings having walls diverging in the direction of the mass of material to be fluidized,
the walls of each opening being defined at least in part by tubular members for conveying a cooling fluid, and
superposed layers of parallel pairs of tubular members,
the tubular members in each layer crossing the tubular members of a next adjacent layer,
a spacing between pairs of tubular members in each layer increasing from said bottom face toward said top face,
the tubular members of each layer defining a portion of opposing walls of at least one said opening.

5,009,853

FLUID CATALYTIC CRACKING REGENERATION WITH REDUCTION OF NITROGEN OXIDE

Richard C. Kovacs, Mantua; Frederick J. Krambeck, Cherry Hill, and Michael S. Sarli, Haddonfield, all of N.J., assignors to Mobil Oil Corporation, Fairfax, Va.

Continuation of Ser. No. 285,574, Dec. 16, 1988, abandoned, which is a division of Ser. No. 71,247, Jul. 9, 1987, abandoned.
This application Apr. 18, 1990, Ser. No. 512,637
Int. Cl.[5] F27B *15/12, 15/08*
U.S. Cl. 422—144 8 Claims



1. In a fluid catalytic cracking unit having a cracking zone including a reactor vessel and a regeneration zone including a catalyst regenerator wherein the improvement comprises:

(i) a regeneration vessel comprising a vessel having a side inlet connected to the reactor for admitting spent cracking catalyst from the reactor to a single dense, fluidized bed of catalyst in which regeneration of the catalyst takes place,

(ii) an outlet for regenerated catalyst at the bottom of the regeneration vessel for withdrawing regenerated catalyst from the dense, fluidized bed of catalyst,

(iii) a gas inlet for injecting oxygen-containing regeneration gas into the dense, fluidized bed of catalyst maintained in the lower portion of the regeneration vessel to regenerate the catalyst,

(iv) a plurality of cyclone separators inside the regeneration vessel for separating entrained catalyst from regeneration effluent gases and returning the separated catalyst to the dense bed in the regenerator, the cyclone separators having inlets above the spent catalyst inlet, disposed to collect regeneration effluent gases from the regeneration vessel at a common collection region so that mixing of the regeneration effluent gases from different points in the regeneration vessel takes place prior to the regeneration gases entering the cyclone separators,

(v) a cyclone separator inlet manifold having a central hub with at least one inlet at the common collection region, and

(vi) outwardly-extending conduits extending from the central hub to the inlets of the cyclone separators connecting the hub to the cyclone inlets.

5,009,854

AXIAL REACTOR WITH COAXIAL OIL INJECTION

William R. Jones, Jr., Monroe, La., assignor to Columbian Chemicals Company, Atlanta, Ga.

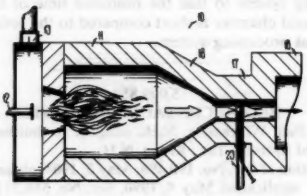
Filed Aug. 31, 1988, Ser. No. 238,588
Int. Cl.[5] C09C *1/00*
U.S. Cl. 422—150 9 Claims

1. Apparatus for producing carbon black, comprising:

a source of hot gas;

a reaction chamber having an inlet receiving a flow of the hot gas and having an outlet opening through which the hot gas flows to leave the reaction chamber; and

means for introducing a hydrocarbon spray into the reaction chamber in a direction substantially parallel and countercurrent to the flow of hot gas, thereby increasing the



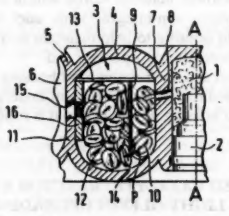
dispersion speed of the hydrocarbon spray in the gas flow and narrowing the particle size distribution of the resulting carbon black particles produced.

5,009,855

GAS GENERATOR FOR INFLATING A SAFETY BAG

Karl E. Nilsson, Ottobrunn, Fed. Rep. of Germany, assignor to Bayern-Chemie Gesellschaft fuer flugchemische Antriebe mbH, Aschau, Fed. Rep. of Germany

Filed Oct. 17, 1989, Ser. No. 422,649
Claims priority, application Fed. Rep. of Germany, Oct. 17, 1988, 3835356
Int. Cl.[5] B60R *21/26, 21/32*
U.S. Cl. 422—164 6 Claims



1. A gas generator for inflating a safety bag, comprising a combustion chamber, fuel in said combustion chamber, ignition means including at least one ignition opening between said ignition means and said combustion chamber, whereby said combustion chamber communicates with said ignition means through said at least one ignition opening for igniting said fuel, at least one gas exit opening communicating with said combustion chamber for permitting gas generated in said combustion chamber to exit from said combustion chamber, a sheet metal insert in said combustion chamber for separating said combustion chamber into a first smaller combustion chamber section communicating with said at least one ignition opening and a second larger combustion chamber section communicating with said exit opening and with said first combustion chamber section, said sheet metal insert being positioned in said combustion chamber for separating said fuel into two portions for a sequential combustion in said second combustion chamber section after combustion in said first combustion chamber section, said sheet metal insert being further positioned to provide a gas flow passage (14, 23, 36) between said first smaller and said second larger combustion chamber sections, said sheet metal insert being spaced from said at least one ignition opening thus providing a continuous flow communication between said first and second combustion chamber sections, wherein said second combustion chamber section holds a quantity of fuel larger than is held in said first combustion chamber section, wherein said quantity of fuel in said first combustion chamber section is ignited and combusted first and wherein said quantity of fuel in said second combustion chamber section is ignited by combusted gas flowing from said first combustion chamber section into said second combustion

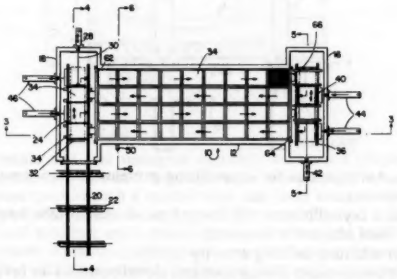
chamber section, whereby said sequential combustion is achieved by a single ignition of said ignition means for generating a gentle initial inflating pressure by the combustion of said quantity of fuel in said first combustion chamber section followed by a rapid pressure increase by the combustion of said quantity of fuel in said second combustion chamber section for a complete inflation of said safety bag.

5,009,856

RECYCLING CATALYST BED FOR FLUE GAS TREATMENT

Michael L. Fenger, McMurray, and Francis R. Vargo, Munhall, both of Pa., assignors to Consolidation Coal Company, Pittsburgh, Pa.

Filed Dec. 5, 1988, Ser. No. 279,738
Int. Cl.[5] B01J *19/22*
U.S. Cl. 422—178 **3 Claims**



1. A recycling catalyst bed having a plurality of catalyst blocks adapted to be positioned in and transported through a flue duct for treating the flue gas and recycling the blocks comprising:

(a) a flue duct having an open interior surface;

(b) a support mechanism for positioning the blocks in the flue duct, said support mechanism having opposed ends adjacent said duct interior surface;

(c) block shifting enclosures exterior of the flue duct adjacent each end of said support mechanism, at least one of said block shifting enclosures having means for cleaning the blocks;

(d) means in each of said block shifting enclosures to support the blocks for shifting movement transverse to said support mechanism;

(e) block pusher mechanisms adjacent to each of said block shifting enclosures to transport the blocks through and into and out of said support mechanism; and,

(f) said support mechanism including an air manifold supplying air to the underside of the blocks to raise the blocks while being transported through said support mechanism to provide friction free movement of the blocks through said support mechanism.

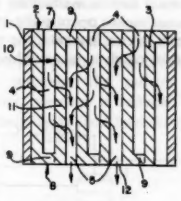
5,009,857

FILTER FOR GASES

Hans A. Haerle, Bopfingen, Fed. Rep. of Germany, assignor to Schwaebische Huettenwerke GmbH, Fed. Rep. of Germany

Filed Feb. 10, 1989, Ser. No. 309,323
Claims priority, application Fed. Rep. of Germany, Mar. 10, 1988, 3807917; May 30, 1988, 3818281
The portion of the term of this patent subsequent to Nov. 20, 2007, has been disclaimed.
Int. Cl.[5] B01D *53/36, 39/10*
U.S. Cl. 422—180 **13 Claims**

1. A gas filter, suitable for removing soot from a combustion exhaust gas stream, which comprises a plurality of identically sized and shaped gas-permeable formed metal plates, each plate having a front face and a back face, each front face containing a plurality of longitudinal channels positioned between longitudinal channel-separating pieces, each channel having an open end and a closed end provided by a transverse closing cross-piece, with adjacent plates of said plurality of plates being positioned with front faces against back faces and with



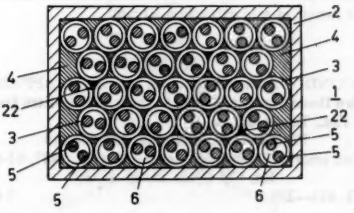
adjacent plates being rotated 180° with respect to each other to provide a head-to-toe arrangement of adjacent plates for providing rows of inlet channels alternating with rows of outlet channels within said gas filter.

5,009,858

DEVICE FOR GENERATING OZONE

Günter Mechtersheimer, Nussbaumen, Switzerland, assignor to Asea Brown Boveri Limited, Baden, Switzerland

Filed Mar. 2, 1990, Ser. No. 487,439
Claims priority, application Switzerland, Mar. 7, 1989, 845/89
Int. Cl.[5] B01J *19/08*
U.S. Cl. 422—186.19 **9 Claims**



1. A device for generating ozone from oxygen or a gas containing oxygen by silent electric discharge in a discharge space through which the oxygen or gas flows, comprising:

a plurality of tubes made of a dielectric material arranged in a cluster and disposed within a housing;

internal electrodes respectively arranged inside each of said tubes and forming a nonhomogenous discharge gap; and

p1 an external electrode surrounding each of said tubes formed by at least one of metalization of external surfaces of each of said tubes and surrounding each of said tubes with an electrically conductive material;

wherein said internal electrodes pass through the entire length of each of said tubes, have a cross section substantially smaller than a cross section of said tubes, and are electrically connected to each other at least at one end of one of said tubes.

5,009,859

EXTRACTION AND REACTOR SYSTEM

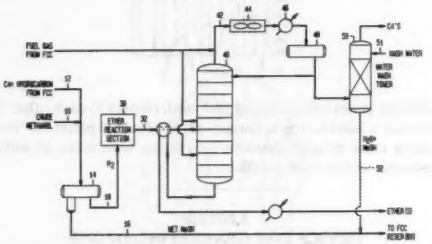
Mohsen N. Harandi, Lawrenceville, and Hartley Owen, Belle Mead, both of N.J., assignors to Mobil Oil Corporation, Fairfax, Va.

Continuation-in-part of Ser. No. 179,725, Apr. 11, 1988, Pat. No. 4,827,045. This application Feb. 9, 1989, Ser. No. 308,072
Int. Cl.[5] B01J *8/04*
U.S. Cl. 422—189 **4 Claims**

1. A continuous feedstock separation and etherification reactor system for converting crude methanol feedstock to methyl tert-alkyl ether comprising:

extractor means for contacting crude feedstock liquid containing a minor amount of water with a liquid hydrocarbon extraction stream under extraction conditions favorable to selective extraction of methanol, thereby providing an extract liquid stream rich in methanol and an aqueous raffinate stream lean in methanol;

first catalytic reactor means operatively connected for contacting the extract stream in a catalytic reaction zone with acid etherification catalyst in an etherification reaction



zone under process conditions to convert a major portion of methanol to ether;

second catalytic reactor means for contacting said raffinate stream with methanol conversion catalyst in the presence of hydrocarbon to produce a liquid hydrocarbon stream; and

means for charging at least a portion of said liquid hydrocarbon stream from said second reactor means to said extractor means as said extraction stream.

5,009,860

SEMICONDUCTOR ROD ZONE MELTING APPARATUS

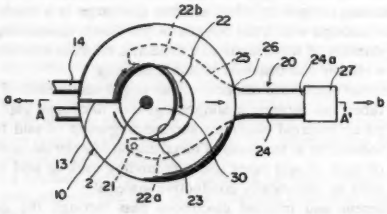
Yasuhiro Ikeda, Annaka, Japan, assignor to Shin-Etsu Handotai Co., Ltd., Tokyo, Japan

Filed Apr. 20, 1988, Ser. No. 184,419

Claims priority, application Japan, May 25, 1987, 62-125804

Int. Cl.[5] C30B *35/00, 13/30*

U.S. Cl. 422—250 7 Claims



1. A semiconductor rod zone melting apparatus comprising:

a main induction heating coil surrounding a floating molten zone of a semiconductor rod, said main coil being single-turn flat coil having an inner diameter defining a central opening;

a single flat metal plate member comprising a pair of arcuate arm members which define an open arcuate portion having a U-shaped inner edge on one side facing said central opening, said inner edge of said open arcuate portion of said metal member having an opening width at least equal to said inner diameter of said main coil;

an electrically insulating member mounted on said metal member between said metal member and said main coil;

said metal member being disposed in adjacent contact with an upper or lower surface of said main coil, whereby said insulating member contacts said main coil; and

said main coil and said metal member being relatively movable with respect to each other perpendicular to an axis defined by said central opening while maintaining contact between said metal member and said main coil, whereby said main coil and said metal member define an opening of variable width in which a concentrated magnetic field is formed upon energizing said main coil.

5,009,861

CRYSTALLIZATION APPARATUS

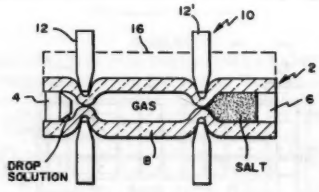
Andreas Plaas-Link, Hanover, Fed. Rep. of Germany, assignor to Intospace GmbH, Hanover, Fed. Rep. of Germany

Filed Aug. 9, 1988, Ser. No. 229,950

Claims priority, application Fed. Rep. of Germany, Aug. 12, 1987, 3726765; Nov. 16, 1987, 3738840

Int. Cl.[5] B01D *9/00;* G01N *21/00;* B01L *11/00;* C30B *30/08*

U.S. Cl. 422—245 31 Claims



1. An apparatus for crystallizing proteins at zero gravity, comprising:

(a) a crystallization cell formed on an elastic tube having ends adapted to be sealed;

(b) said tube defining a cavity therein;

(c) clamp means having open and closed positions for reversibly dividing said cavity into a plurality of cells for receiving various solutions;

(d) said clamp means comprising a compression clamp;

(e) means for opening and closing said clamp means;

(f) first mechanical means for applying a first external pressure only to a peripheral portion of said tube;

(g) said first mechanical pressure applying means being positioned in tight engagement on a first external side portion thereof;

(h) second mechanical means for applying a second external pressure to another peripheral portion of said tube; and

(i) said second mechanical pressure applying means being positioned in tight engagement on a second external side portion of said tube lying generally opposite to said first external side portion thereof;

(j) wherein when said clamp means is switched from a closed to an open position for allowing intermixing of any solutions contained in said cells, said first external pressure applying means prevents formation of any partial vacuum in said tube to thereby prevent any gas losses.

5,009,862

APPARATUS AND PROCESS FOR GROWING CRYSTALS OF SEMICONDUCTOR MATERIALS

Michio Kida, Urawa; Yoshiaki Arai, Ohmiya, and Kensho Sahira, Yono, all of Japan, assignors to Mitsubishi Kinzoku Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 201,018, Jun. 1, 1988, Pat. No. 4,936,949. This application May 23, 1990, Ser. No. 527,887

Claims priority, application Japan, Jun. 1, 1987, 62-137985; Sep. 24, 1987, 62-239880

Int. Cl.[5] C30B *15/12*

U.S. Cl. 422—249 13 Claims

1. An apparatus for melting a semiconductor material and growing a semiconductor crystal from the melted material, comprising:

(a) a susceptor having a peripheral rim;

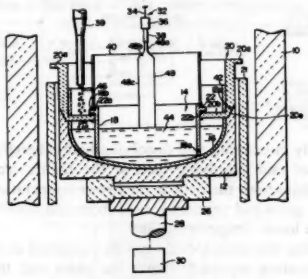
(b) a crucible assembly made of quartz for receiving the semiconductor material therein, said crucible assembly

including an outer crucible housed in and supported by said susceptor and an inner crucible adapted to be so placed within said outer crucible as to define a multi-wall structure;

(c) fluid passage means for permitting the melted material to flow between said inner and outer crucibles when the multi-wall structure is defined by said inner and outer crucibles;

(d) holding means for holding said inner crucible;

(e) drive means operable to move at least one of said holding



means and said susceptor vertically between a coupled position where said holding means is supported by said susceptor in such a manner that said inner crucible is so placed within said outer crucible as to define the multi-wall structure and a released position where said holding means is disengaged from said susceptor in such a manner that said inner crucible is released from said outer crucible; and

(f) heating means disposed so as to surround said susceptor for heating the semiconductor material contained in said crucible assembly.

5,009,863

APPARATUS FOR MANUFACTURING SILICON SINGLE CRYSTALS

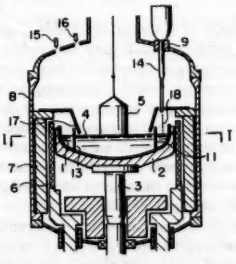
Yoshinobu Shima, Yokohama, and Hiroshi Kamio, Tokyo, both of Japan, assignors to NKK Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 433,596, Nov. 8, 1989. This application Jun. 19, 1990, Ser. No. 540,647

Claims priority, application Japan, Nov. 11, 1988, 63-284017

Int. Cl.[5] C30B *35/00, 15/12*

U.S. Cl. 422—249 **4 Claims**



1. In a silicon single crystal manufacturing apparatus comprising a rotation-type cellular quartz crucible containing molten silicon, an electric resistance heater for heating said quartz crucible from the side thereof, a quartz partition member arranged to divide said molten silicon into a single crystal growing section and a starting material melting section within said quartz crucible, said partition member being formed with at least one hole for passing molten silicon therethrough, a heat keeping cover arranged to cover an inner side of said partition member and above said starting material melting section, and starting material feeding means for continuously feeding starting material silicon to said starting material melting section whereby manufacturing silicon single crystals of not less than 12 cm and not greater than 30 cm in diameter, the improvement wherein said partition member is made from cellular silica glass having a cell content, in volume percent, ranging from 0.01% to 15%, and wherein the cell content of the quartz crucible is over 1.3 times greater than the cell content of the partition member, whereby the radiant heat dissipation through said partition member is reduced to a range from 5/1000 to 40/100 times the radiant heat dissipation of non-cellular silica glass.

5,009,864

RECHARGING DEVICE FOR CZOCHRALSKI METHOD

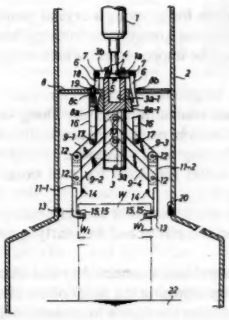
Hiroyuki Ibe, and Toshiharu Uesugi, both of Fukui, Japan, assignors to Shin-Etsu Handotai Company Limited, Tokyo, Japan

Filed Oct. 25, 1989, Ser. No. 426,293

Claims priority, application Japan, Oct. 27, 1988, 63-269576

Int. Cl.[5] C30B *35/00, 15/02;* **B66C** *1/66*

U.S. Cl. 422—249 **7 Claims**



1. A recharging apparatus suitable for use in forming monocrystal ingots by the Czochralski method, comprising:

a vertical conduit having disposed therein a recharging device comprising a shaft means capable of being vertically suspended from a pulling means of a Czochralski-type monocrystal ingot pulling apparatus for providing movable support therein;

slider means for providing support while freely sliding along the shaft means and slidably guided within said vertical conduit;

a pair of hook means pivotably connected to the shaft means below the slider means and capable of assuming hooking and unhooking positions for selectively supporting an element of a replenishment material;

a pair of rod means having respective upper ends flexibly connected to the slider means and having respective lower ends pivotably connected to the respective hook means such that when the slider means slides upward relative to the shaft means the hook means are caused to assume said unhooking position, and when the slider slides downward relative to the shaft means the hook means are caused to assume said hooking position; and

stopper means provided in said vertical conduit for stopping a downward movement of the slider means when the slider means makes contact with the stopper means.

5,009,865

BAR AND CRUCIBLE MAGNETIC SUSPENSION FOR A CRYSTAL-GROWING APPARATUS

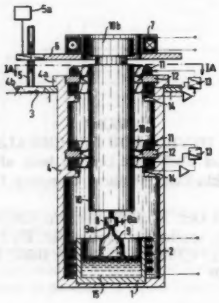
Karl Boden, Jülich; Harald Ibach, Aachen-Verlautenheide, and Udo Linke, Düen, all of Fed. Rep. of Germany, assignors to Kernforschungsanlage Jülich GmbH, Jülich, Fed. Rep. of Germany

Filed Sep. 4, 1985, Ser. No. 772,557

Claims priority, application Fed. Rep. of Germany, Sep. 4, 1984, 3432467

Int. Cl.[5] C30B *35/00, 15/30*

U.S. Cl. 422—249 20 Claims



1. In an apparatus for growing a crystal member in the form of a bar along a crystal growth axis from molten material from a source member, the improvement which comprises in combination:

an elongated magnetizable core connected to one of said members and extending generally along said axis;

an axial stabilization magnet magnetically coupled to said core for effecting axial positioned of said core; and

at least one radial stabilizer for said core, said stabilizer comprising:

a plurality of electromagnets radially juxtaposed with said core, spaced therefrom and angularly spaced around said core,

an electric control unit connected to said electromagnets for automatically adjusting the fields of the electromagnets to precisely position the core with concentricity with respect to said electromagnets, and

position sensing means responsive to the radial spacing of said core from said electromagnets and connected to said electric control unit for inducing changes in said fields of said electromagnets to maintain said core radially in position during the crystal growing of said bar and independently of the operation of said axial stabilization magnet for effecting axial positioning of said core.

5,009,866

FUSED SALT PROCESS FOR PURIFYING ZIRCONIUM AND/OR HAFNIUM TETRACHLORIDES

Ernest D. Lee, Ogden, Utah, assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 16, 1989, Ser. No. 437,152

Int. Cl.[5] C01G *25/04, 27/04*

U.S. Cl. 423—73 10 Claims

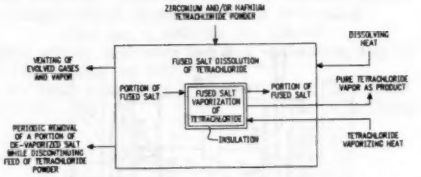
1. A fused salt process for continuously purifying zirconium and/or hafnium tetrachloride dissolved in a molten bath in a vessel, comprising the steps of:

maintaining a mass of a suitable mixture of salts, including zirconium and/or hafnium tetrachloride;

heating said mixture of salts to a temperature at or immediately below the vaporization temperature of the zirconium and/or hafnium tetrachloride at which temperature said mixture of salts is fused to form a molten, tetrachloride-dissolving bath;

continuously introducing into said dissolving bath a zirconium and/or hafnium tetrachloride powder;

heating a portion of said dissolving bath in situ to a temperature higher than the vaporization temperature of the zirconium and/or hafnium tetrachloride so as to vaporize the tetrachloride;


ZIRCONIUM AND/OR HAFNIUM TETRACHLORIDE POWDER
DISSOLVING HEAT
VENTING OF EVOLVED GASES AND VAPOR
FUSED SALT DISSOLUTION OF TETRACHLORIDE
PORTION OF FUSED SALT
FUSED SALT VAPORIZATION OF TETRACHLORIDE
PORTION OF FUSED SALT
PURE TETRACHLORIDE VAPOR AS PRODUCT
PERIODIC REMOVAL OF A PORTION OF DE-VAPORIZED SALT WHILE DISCONTINUING FEED OF TETRACHLORIDE POWDER
INSULATION
TETRACHLORIDE VAPORIZING HEAT

internally circulating said dissolving bath whereby the portion of said dissolving bath at the higher temperature circulates with the bath at the lower temperature;

venting gases and vapors evolved from said dissolving bath at the lower temperature; and

recovering the tetrachloride vapors vaporized at the higher temperature separately from the gases and the vapors evolved at the lower temperature.

5,009,867

C-GEL COMPOSITE PIZZA SNACK KIT

John F. Kratochvil, Oakbrook, Ill., assignor to Kraft General Foods, Inc., Glenview, Ill.

Division of Ser. No. 307,069, Feb. 6, 1989, which is a continuation-in-part of Ser. No. 658,618, Oct. 9, 1984, Pat. No. 4,684,533, which is a continuation-in-part of Ser. No. 81,115, Aug. 3, 1987, abandoned. This application Jan. 25, 1990, Ser. No. 470,153

Int. Cl.[5] A23L *1/04;* A23C *20/02*

U.S. Cl. 426—128 6 Claims

1. A pizza snack kit for preparation of a heated pizza snack, comprising:

at least one slice of a thermoreversible C-gel pizza sauce composite product which may be readily melted when heated, comprising a structurally firm, continuous phase gelatin-carrageenan matrix comprising at least about 0.5 weight percent kappa carrageenan, at least about 1.0 weight percent gelatin having a bloom strength of at least about 125, at least about 20 weight percent of pizza sauce components, and from about 30 to about 80 weight percent of water, based on total product weight, said carrageenan and said gelatin being present in a continuous carrageenangelatin phase which is structurally firm at refrigeration temperature and which is mobile at a temperature of 160° F., with said pizza sauce components being dispersed in said continuous carrageenan-gelatin phase,

a prepackaged cheese topping; and

at least one prepackaged baked pizza crust, such that a consumer may place said at least one structurally firm C-gel pizza sauce slice product on said baked pizza crust and said cheese topping on said structurally firm C-gel slice and heat the crust, slice and cheese topping in an oven to produce a heated pizza snack.

5,009,868

PROCESS FOR THE EXTENDED USE OF STRIP ACID EMPLOYED IN THE RECLAMATION OF BATTERY ACID FLUID FROM EXPANDED LEAD-ACID BATTERIES

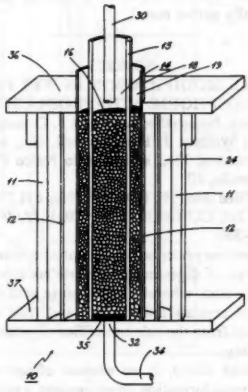
Robert A. Spitz, Holbrook, Mass., and Mark Bricker, Kutztown, Pa., assignors to East Penn Manufacturing Co., Inc., Lyon Station, Pa.

Continuation-in-part of Ser. No. 312,429, Feb. 2, 1989, Pat. No. 4,971,780, which is a continuation-in-part of Ser. No. 133,132, Dec. 14, 1987, abandoned. This application Dec. 21, 1989, Ser. No. 454,770

The portion of the term of this patent subsequent to Nov. 20, 2007, has been disclaimed.

Int. Cl.[5] **C01B** *17/90*

U.S. Cl. 423—139 **9 Claims**



1. In a method for recycling contaminated sulfuric acid from lead acid batteries to reclaimed sulfuric acid for reuse in said batteries by removing contaminating iron impurities, the steps which comprise:

(a) diluting the contaminated sulfuric acid to a concentration between 150 and 230 grams per liter;

(b) filtering the sulfuric acid through a first filter means to remove solid impurities;

(c) oxidizing the sulfuric acid to assure that the iron contaminants are substantially in a ferric form;

(d) removing the iron contaminants from the sulfuric acid through liquid-liquid extracting using an extraction agent comprising mixture of a mono- or di-alkyl phosphoric acid and a metal chelation collector selected from the group consisting of a 8-hydroxyquinoline substituted in the No. 7 position with a long chain aliphatic hydrocarbon radical and an oil-soluble 2-hydroxy benzophenoneoxime, a modifier which maintains solubility of the phosphoric acid and the metal chelation collector and enhances phase disengagement, and a water immiscible carrier, the molar ratio of the 8-hydroxyquinoline and the phosphoric acid being between 1:1::1:4, respectively; wherein the ratio of extraction agent to water immiscible carrier is greater than 10:90; said extraction performed at a volumetric ratio between said sulfuric acid and said extraction agent of between 4:1::1:4, and repeated until the contaminating iron impurities are substantially reduced;

(e) filtering the product of step (d) to remove residual extraction agent;

(f) adding concentrated sulfuric acid to return the sulfuric acid concentration of the product of step (e) to a sulfuric acid concentration for use in new lead acid batteries, the final concentration of iron in the sulfuric acid being no more than 20 parts per million; and

(g) removing the contaminating elements from the extraction agent by contacting said extraction agent with a strip acid with an acid concentration of between 30 and 50%, the improvement which comprises:

(h) reusing the extraction agent to perform further extractions of ferric iron from contaminated sulfuric acid solution;

(i) treating the strip acid with means to reduce a portion of the removed ferric iron to ferrous iron;

(j) reusing the strip acid product of step (i), containing reduced iron, in step (g) to remove contaminating ferric iron from extraction agent.

5,009,869

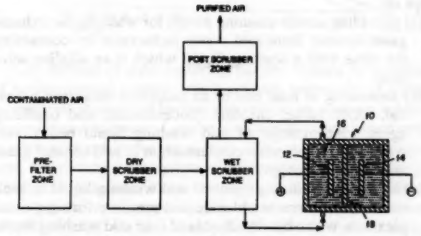
METHODS FOR PURIFICATION OF AIR

Norman L. Weinberg, Amherst; John D. Genders, Lancaster, and Alfred O. Minklei, Grand Island, all of N.Y., assignors to Electrocinerator Technologies, Inc., East Amherst, N.Y.

Filed Dec. 28, 1987, Ser. No. 138,441

Int. Cl.[5] **B01D** *47/00;* **B01J** *8/00;* **C01B** *17/16, 31/20*

U.S. Cl. 423—210 **9 Claims**



1. A method for purification of air and destruction of pollutants therein, which comprises the steps of cleaning polluted air in a scrubber zone by sorbing the pollutants with a scrubber liquid comprising an electrochemically regeneratable degradant comprising pollutant destruction rate potentiating combinations of redox couples selected from the group consisting of Cr^{+6}/Cr^{+3} and Ce^{+4}/Ce^{+3}; Cr^{+6}/Cr^{+3} and Br_2/Br^-; Ce^{+4}/Ce^{+3} and Br_2/Br^-; and Cr^{+6}/Cr^{+3}, Ce^{+4}/Ce^{+3} and Br_2/Br^-; converting the pollutants in said scrubber liquid to a substance of lesser toxicity or hazard; reactivating the spent degradant combination in said scrubber liquid to an active state while also degrading any residual pollutant by oxidizing in an electrolyzer zone, and returning said reactivated scrubber liquid to said scrubber zone for further cleaning of polluted air.

5,009,870

METHOD FOR REMOVING SULPHUR AND NITROGEN COMPOUNDS FROM GAS

Seppo O. Heimala; Olli V. J. Hyvärinen, both of Pori, and Maija-Leena Metsärinta, Ulvila, all of Finland, assignors to Outokumpu Oy, Helsinki, Finland

PCT No. PCT/FI89/00077, § 371 Date Dec. 12, 1989, § 102(e) Date Dec. 12, 1989, PCT Pub. No. WO89/10181, PCT Pub. Date Nov. 2, 1989

PCT Filed Apr. 26, 1989, Ser. No. 438,450

Int. Cl.[5] **B01J** *8/00;* **C01B** *17/00, 21/00*

U.S. Cl. 423—239 **17 Claims**

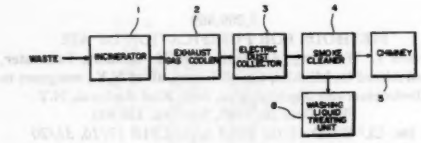
1. A method for removing sulphur and nitrogen compounds from gases, comprising reducing sulphur dioxide, hydrogen sulphide and nitric oxides from gases by contacting the gases with long-chained sulphur compounds selected from the group consisting of polysulphides and polythionates containing 3–20 sulphur atoms per molecule, at a pH within the range of 0–4, while using an electroconductive solid material as a carrier for said long-chained sulphur compounds.

5,009,871

METHOD OF REMOVING MERCURY IN EXHAUST GASES FROM A WASTER INCINERATOR

Nariyoshi Higuchi, Kanagawa; Miki Yamagishi, Tokyo, and Tsuneharu Miyachi, Kanagawa, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 832,410, Feb. 24, 1986, abandoned.
This application Jan. 13, 1988, Ser. No. 144,695
Claims priority, application Japan, Aug. 31, 1984, 59-180698
Int. Cl.[5] B01D *53/34;* C25B *11/04*
U.S. Cl. 423—240 3 Claims



1. A method of removing mercuric chloride contained in exhaust gases emitted from a waste incinerator comprising the steps of:

(a) providing smoke cleaning means for washing the exhaust gases emitted from said waste incinerator by contacting the same with a washing liquid which is an alkaline solution:

(b) measuring at least one of an oxidation-reduction potential, COD value, chlorine concentration, and oxidizing agent concentration of said washing liquid before said washing, or a chlorine concentration in said exhaust gases after said washing;

(c) adding an oxidizing agent to said washing liquid to such extent that mercuric chloride and mercury forming complex ions with chlorine dissolved into said washing liquid by the washing of said exhaust gases are no longer reduced by reducing substances contained in said washing liquid, said oxidizing agent being suitable for oxidizing reducing substances formed in the washing liquid by the washing of the exhaust gases, whereby mercury in the form of mercuric chloride and mercury forming complex ions with chlorine is prevented from being reduced;

(d) determining a value at which at least one of an oxidation-reduction potential, COD value, chlorine concentration, and oxidizing a sent concentration of said washing liquid, or a chlorine concentration in said exhaust gases, prevents said mercuric chloride and mercury forming complex ions with chlorine from being reduced; and

(e) washing said exhaust gases with said washing liquid in which an amount of said oxidizing agent is controlled in order to maintain the value determined in step (d) so that the mercuric chloride and mercury forming complex ions with chlorine in said washing liquid are prevented from being reduced and so that excessive amounts of the oxidizing agent are prevented from being added to said washing liquid, thus preventing the occurrence of any corrosion of the waste incinerator.

5,009,872

METHOD OF OXIDIZING GASEOUS SUBSTANCES

Karl T. Chuang, Edmonton, Canada; James B. McMonagle, Birdhill, Ireland; Robert J. Quaiattini, Calgary, Canada; William A. Seddon, Deep River, Canada, and David E. Clegg, Pembroke, Canada, assignors to Atomic Energy of Canada Ltd., Ontario, Canada

Continuation-in-part of Ser. No. 166,742, Mar. 2, 1988, abandoned, which is a continuation of Ser. No. 46,541, Jun. 5, 1987, abandoned. This application Nov. 23, 1988, Ser. No. 275,188
Claims priority, application Canada, May 12, 1986, 508959
Int. Cl.[5] B01D *53/36*
U.S. Cl. 423—245.3 15 Claims

1. A method of oxidizing a gaseous substance selected from the group consisting of carbon monoxide, ethanol, methanol, 2-propanone and formaldehyde in a feed gas, which process comprises passing such gaseous substance and oxygen at an input temperature of −50° to 150° C., in which the gaseous substance is present as less than 2% of the feed gas, and the balance of the feed gas is oxygen and gases which do not inhibit oxidation of the said gaseous substance under the reaction conditions; into contact with

(a) a hydrophobic, porous catalyst having a specific surface area of from 200 to 600 m^2/g support, formed of porous copolymerized styrene divinylbenzene, and

(b) a catalytically active metal on the support, the catalytically active metal being selected from the group consisting of chromium, molybdenum, tungsten, manganese, rhenium, iron, ruthenium, osmium, cobalt, rhodium, iridium, nickel, palladium, platinum, copper and silver, the amount of catalytically active metal being in the range of 0-1 to 22 wt % of the total weight of the support and catalytically active metal.

5,009,873

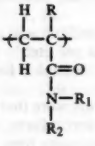
CRYSTAL MODIFICATION IN WET PROCESS PHOSPHORIC ACID PRODUCTION

E. Michael Kerr, Naperville; Lawrence J. Connelly, Oak Lawn, both of Ill.; William J. Roe, Roswell, Ga., and Robert M. Vallowe, Brandon, Fla., assignors to Nalco Chemical Company, Naperville, Ill.

Filed Jan. 29, 1990, Ser. No. 471,778
Int. Cl.[5] G01B *25/16;* C01F *11/46*
U.S. Cl. 423—320 19 Claims

1. A wet process phosphoric acid production process comprising the steps of digesting phosphate rock in a slurry containing sulfuric acid, whereby phosphoric acid is released and calcium sulfate crystals are formed, and then separating the phosphoric acid from the calcium sulfate crystals, the improvement comprising:

adding to said slurry, in an amount effective for calcium sulfate crystal formation improvement, a polymer containing monomer units of Formula I,



Formula I

wherein R is hydrogen or methyl and R_1 and R_2 are independently hydrogen, alkyl or sulfoalkyl substituents;

wherein said polymer is comprised of monomer units of said Formula I wherein both of R_1 and R_2 are hydrogen and monomer units of said Formula I wherein one of said R_1 and R_2 is a sulfoalkyl substituents;

wherein said polymer is present at the calcium sulfate crystal nucleation phase of said digestion step; and

wherein said polymer is added in a water-soluble salt form.

5,009,874

HYDROPHOBIC PRECIPITATED SILICA GRANULES

Francois Parmentier, Lyons, and Jacques Persello, Montluel, both of France, assignors to Rhone-Poulenc Chimie, Courbevoie, France

Filed Apr. 13, 1988, Ser. No. 181,312
Claims priority, application France, Apr. 13, 1987, 87 05199
Int. Cl.[5] C01B *33/14*
U.S. Cl. 423—335 9 Claims

1. Hydrophobic, essentially spheroidal precipitated silica granules having a median particle size of at least 0.08 mm, a density of at least 0.15, a water wettability of at least 20%, and a maximum water uptake of 5%.

5,009,875

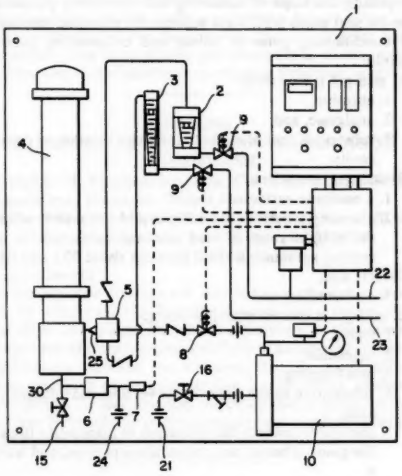
PROCESS OF PREPARING CLORINE DIOXIDE AND APPARATUS THEREFOR

Joseph M. Kelley, Westfield, N.J.; Donald C. Kucher, Quakertown, Pa., and George Mayurnik, Franklin Lakes, N.J., assignors to International Dioxcide, Inc., Clark, N.J.

Filed Aug. 3, 1988, Ser. No. 227,634

Int. Cl.[5] C01B *11/02*; G05D *7/00*

U.S. Cl. 423—477 11 Claims



1. A system for the generation of chlorine dioxide which comprises

(a) supply means for a water stream and means for delivering the water stream to a reaction zone;

(b) supply means for reactant compounds, which when reacted together yield chlorine dioxide, and feed lines for separately feeding the reactant compounds to the water stream for reaction in the reaction zone;

(c) mixing means for insuring complete mixing of the compounds after feeding the reacting compounds to the water stream;

(d) means for transferring the reaction product from the reaction zone;

(e) shutoff valves in the feed lines of the reactant compounds;

(f) a monitoring system for monitoring the supply of water and reactant compounds through the feed lines, with the monitoring system being in cooperation with the shutoff valves such that the shutoff vales are closed to restrict any further flow through the feed lines of the reactant compounds when the monitoring system detects a loss in the supply of the reactant compounds or water, whereby the activation of the shutoff valves in the feed lines results in a continued flow of the water stream to purge the feed lines of any reactant compounds or chlorine dioxide; and

(g) a pH meter downstream of the reaction zone, with the pH meter monitoring the pH of the chlorine dioxide reaction product solution being transferred from the reaction zone, and the pH meter being in cooperation with the shutoff valves in the feed lines such that the shutoff valves are closed to restrict any further flow through the feed lines when a pH outside the range of from about 2.7 to about 3.5 is detected.

5,009,876

METHOD OF MANUFACTURING BARIUM TITANATE $BATIO_3$

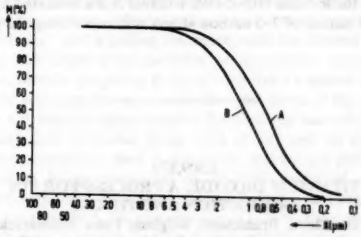
Detlev F. K. Hennings, and Herbert J. Schreinemacher, both of Aachen, Fed. Rep. of Germany, assignors to U.S. Philips Corp., New York, N.Y.

Continuation of Ser. No. 105,066, Oct. 5, 1987, abandoned. This application Feb. 10, 1989, Ser. No. 309,467

Claims priority, application Fed. Rep. of Germany, Oct. 16, 1986, 3635532

Int. Cl.[5] C01G *23/00*

U.S. Cl. 423—598 13 Claims



1. A method of manufacturing barium titanate by pyrolysis of barium titanyl oxalate which consists essentially of adding an aqueous solution of barium chloride to an aqueous solution comprising a mixture of oxalic acid and titanium oxychloride at a temperature in the range from 20° C. to 60° C., with agitation, to produce a precipitate of barium titanyl oxalate having a barium to titanium ratio in the range of 1:1.015 to 1:1.025; and calcining the resultant precipitate at a temperature in the range of 900° to 1300° C. for a time period effective to form barium titanate, said barium titanate having improved grindability, increased sinterability and comprising primary particles having a smaller grain size when compared to barium titanate obtained when aqueous solutions of barium chloride, titanium chloride and oxalic acid are reacted and the barium to titanium ratio is not within said 1:1.015 to 1:1.025 range.

5,009,877

STABILIZATION OF ACICULAR FERROMAGNETIC CHROMIUM DIOXIDE

Werner Steck; Laszlo Marosi, both of Ludwigshafen; Herbert Haberkorn, Gruenstadt; Rainer Feser, Hessheim; Werner Huebner, and Helmut Jakusch, both of Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 917,611, Oct. 10, 1986, abandoned. This application Feb. 20, 1990, Ser. No. 481,777

Claims priority, application Fed. Rep. of Germany, Oct. 10, 1985, 3536116

Int. Cl.[5] C01G *37/02*

U.S. Cl. 423—607 3 Claims

1. A process for stabilizing acicular ferromagnetic chromium dioxide which consists essentially of heating the chromium dioxide in an aqueous suspension which contains sufficient alkali metal hydroxide to adjust the pH of the suspension to greater than 9 and at from 35° C. to the boiling point of the suspension for not less than 20 minutes to form chromium dioxide particles consisting of a CrO_2 core and at least a partial nonmagnetic Cr OOH— containing shell wherein the chromium dioxide possesses orthorhombic Cr OOH at least on part of its surface.

5,009,878

ZIRCONIUM DIOXIDE POWDER, PROCESSES FOR ITS PREPARATION AND ITS USE FOR THE PRODUCTION OF SINTERED ARTICLES

Helmut Scharf, Aurich, Fed. Rep. of Germany, assignor to Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed May 31, 1990, Ser. No. 531,412

Claims priority, application Fed. Rep. of Germany, Jun. 2, 1989, 3918013

Int. Cl.[5] C01G *25/00*

U.S. Cl. 423—608 **11 Claims**

1. A process for the preparation of zirconium dioxide powder, comprising melting zirconyl chloride in the presence of a diol of the formula HO-Z-OH, wherein X is a saturated hydrocarbon radical of 2–5 carbon atoms, and recovering the product.

5,009,879

TITANIUM DIOXIDE, A PROCESS FOR ITS PRODUCTION AND ITS USE

René De Cleyn, Brasschaat, Belgium; Peter Thometzek, and Jakob Rademachers, both of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Nov. 20, 1989, Ser. No. 438,315

Claims priority, application Fed. Rep. of Germany, Nov. 29, 1988, 3840196

Int. Cl.[5] C01G *23/047*

U.S. Cl. 423—610 **4 Claims**

1. A titanium dioxide composition comprising TiO_2 predominantly in the form of isometric primary particles from 0.5 to 5.0 μm in size, which are aggregated by calcination to predominantly spherical particles 1 to 100 μm in diameter, with a BET surface area of 1 to 4.5 m^2/g and an apparent density of 0.2 to 1.3 kg/l.

5,009,880

COMPOSITION AND PROCESS FOR THE TREATMENT OF KERATIN MATERIALS WITH POLYMERS

Jean-Francois Grollier, Paris; Claire Fiquet, Paris; Chantal Fourcadier, Paris; Claude Dubief, Versailles, and Daniele Cauwet, Crosne, all of France, assignors to L'Oreal, Paris, France

Continuation of Ser. No. 749,440, Jun. 27, 1985, Pat. No. 4,719,099, which is a continuation of Ser. No. 587,008, Mar. 7, 1984, abandoned, which is a continuation of Ser. No. 180,443, Aug. 22, 1980, Pat. No. 4,445,521, which is a continuation of Ser. No. 886,554, Mar. 14, 1978, Pat. No. 4,240,450. This application Nov. 4, 1987, Ser. No. 116,667

Claims priority, application Luxembourg, Mar. 15, 1977, 76955

The portion of the term of this patent subsequent to Dec. 23, 1997, has been disclaimed.

Int. Cl.[5] A61K *7/06, 7/08, 9/12*

U.S. Cl. 424—047 **14 Claims**

1. A composition for the cosmetic treatment of hair, skin or nails comprising an anionic polymer possessing sulfonic acid grouping having a molecular weight of 500 to 5 million and a cationic polymer containing primary, secondary, tertiary or quaternary amino groups, having a molecular weight of 500 to 5 million, said cationic polymer being characterized by a low substantivity in a solvent medium, said anionic and cationic polymers being present each in an amount from about 0.01 to 10% by weight.

5,009,881

ORAL HYGIENE GELS

Ira D. Hill, Clay Ct., Locust, N.J. 07760, and Robert D. White, 65 Glen Grey Rd., Oakland, N.J. 07436

Continuation-in-part of Ser. No. 927,752, Nov. 6, 1986, and Ser. No. 927,805, Nov. 6, 1986, Pat. No. 4,950,479. This application Jun. 8, 1990, Ser. No. 535,499

Int. Cl.[5] A61K *7/16*

U.S. Cl. 424—49 **11 Claims**

1. An oral hygiene method for cleaning, massaging and conditioning gums of edentulous persons and babies and infants prior to teething, and up through the time the child itself can effectively control plaque formation, by regular brushing, comprising the steps of removing and disrupting plaque-like films on said gums with a gel suitable for cleaning, massaging and conditioning gums of babies and endentulous persons, wherein:

A. said gel is free from:

1. abrasive,
2. analgesic, and
3. substances that alter the microflora balance of the oral cavity;

B. said gel comprises;

1. a nonionic surfactant,
2. a coating substance insoluble in said surfactant, wherein the weight ratio of said nonionic surfactant to said coating substance is from between about 50:1 and about 1:1 and;
3. a viscosifier; and

C. said gel is characterized as being:

1. stable,
2. ingestible,
3. non-foaming,
4. substantive to the gums of babies and endentulous persons,
5. disruptive towards the formation of plaque-like films on the gums of babies and endentulous persons, and having a
6. pH of from between about 3.0 and about 8.5.

5,009,882

USE OF A CARBOXY STARCH POLYMER TO INHIBIT PLAQUE WITHOUT TOOTH STAINING

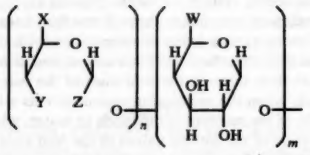
Charles R. Degenhardt, and Barbara A. Kozikowski, both of Cincinnati, Ohio, assignors to The Proctor & Gamble Company, Cincinnati, Ohio

Filed May 21, 1990, Ser. No. 526,930

Int. Cl.[5] A61K *7/16, 7/18, 9/68*

U.S. Cl. 424—52 **26 Claims**

1. An oral composition comprising: (a) a safe and effective amount of a plaque-inhibiting starch polymer comprising the formula



wherein W and X are independently selected from CH_2OH, CHO and CO_2H, or the neutralized carboxylic acid salts thereof, Y and Z are independently selected from CHO and CO_2H, or the neutralized carboxylic acid salts thereof, n is in the range of from about 5 to about 2500, m is in the range of from 0 to about 2500, provided that the sum of n and m ranges from about 5 to about 2500, and the degree of carboxylation of said polymer ranges from about 1 to about 3; and (b) a pharmaceutically acceptable carrier.

5,009,883

AQUEOUS STANNOUS FLUORIDE NON-ABRASIVE HOME TREATMENT GEL COMPOSITIONS

Christopher H. Suhonen, San Jose, Calif., assignor to Gillette Canada Inc., Montreal, Canada

Division of Ser. No. 437,467, Nov. 15, 1989, Pat. No. 4,960,586. This application Jul. 25, 1990, Ser. No. 557,882

Int. Cl.[5] A61K *7/18, 33/16*

U.S. Cl. 424—52 3 Claims

1. An aqueous non-abrasive home treatment gel composition consisting essentially of water-unstable stannous fluoride and a lower alkyl vinyl ether and maleic anhydride copolymer as the essential stannous ion chelate forming stabilizer in an amount sufficient to effectively stabilize the stannous fluoride concentration against stannous oxide precipitation by providing oxidation protection to the stannous ion, the composition being substantially free from soluble pyrophosphates, silica containing compounds, and aldehyde containing flavoring agents.

5,009,884

STABILIZED AQUEOUS STANNOUS FLUORIDE MOUTHWASH

Christopher H. Suhonen, San Jose, Calif., assignor to Gillette Canada Inc., Montreal, Canada

Division of Ser. No. 437,469, Nov. 15, 1989, Pat. No. 4,970,065. This application Jul. 25, 1990, Ser. No. 557,881

Int. Cl.[5] A61K *7/18, 33/16*

U.S. Cl. 424—52 3 Claims

1. An aqueous mouthwash composition consisting essentially of water-unstable stannous fluoride and a lower alkyl vinyl ether and maleic anhydride copolymer as the essential stannous ion chelate forming stabilizer in an amount sufficient to effectively stabilize the stannous fluoride concentration against stannous oxide precipitation by providing oxidation protection to the stannous ion, the composition being substantially free from soluble pyrophosphates and aldehyde containing flavoring agents.

5,009,885

METHOD OF PROTECTING THE MUCOUS MEMBRANES OF THE MOUTH WHILE TREATING TEETH

David K. Yarborough, 3705 Northcote Dr., Birmingham, Ala. 35223

Division of Ser. No. 406,418, Sep. 11, 1989, Pat. No. 4,983,380. This application Nov. 19, 1990, Ser. No. 600,683

Int. Cl.[5] A61K *7/18, 7/20, 33/40*

U.S. Cl. 424—53 3 Claims

1. A method of protecting the mucous membranes of the mouth while using a hydrogen peroxide solution to whiten the teeth comprising the steps of:

(a) forming a reusable mold of the teeth and adjacent gingival area of a patient's mouth;

(b) combining an aqueous hydrogen peroxide solution with a gelatinous mucoprotectant water soluble sodium stearate gel to form an emulsion;

(c) placing said emulsion in said mold in a quantity sufficient to coat the teeth when placed thereabout; and

(d) positioning said teeth in said mold for a predetermined period of time.

5,009,886

DENTIFRICE

Mohammad R. Ahmad, Glenview, and Oscar A. Barke, Skokie, both of Ill., assignors to Floss Products Corporation, Morton Grove, Ill.

Filed Oct. 2, 1989, Ser. No. 416,101

Int. Cl.[5] A61K *7/26, 35/78*

U.S. Cl. 424—58 2 Claims

1. In a gel dentifrice for caring for one's teeth and gums, the combination of 20–60 mesh or less natural form micro-sized particles or microfibers of the branches or roots of trees botanically known as the azadirachta or salvadora persica, the micro-sized particles or microfibers being formed by mechanically grinding and/or chopping the branches or roots of the trees to very fine particles, dry-filtering these particles through very fine screens, of the order of 20–60 mesh, to yield 20–60 mesh or less micro-sized particles or microfibers, the improvement consisting of the steps of mixing the yielded micro-sized particles or microfibers in a bath of deionized water and a minute quantity of methylparaben and heating the composite liquid to 70–95 degrees Centigrade for 10–40 minutes, and filtering the composite liquid with only minimal pressure differential through a very fine cloth bag filter of the order of 20–60 mesh to yield a filtered liquid having 20–60 mesh or less micro-sized particles or microfibers suspended therein; mixing artificial sugarless sweetener, a flavor enhancer, a vitamin supplement, a gum healer, and a gelling thickener, with the filtered liquid having the micro-sized particles or microfibers suspended therein, thereby providing in the gel dentifrice a natural astringent for acting on the gums and other soft tissue of the mouth and a soft nondamaging abrasive for cleaning and whitening the teeth and otherwise being void of any and all mineral abrasives commonly used in dentifrice; and the gel dentifrice by weight being comprised of 10–20% deionized water; 30–60% sorbitol; 5–15% extract liquid; 5–15% liquid vegetable glycerine solvent; 1–3% carrageenan; 0.1–2.0% titanium dioxide coloring; 0.1–0.5% sodium lauryl sulfate surfactant; and 0.5–2% mint flavor.

5,009,887

DEODORANT COMPOSITION IN THE FORM OF A GEL

Takashi Iwahashi, Sagamihara, Japan, assignor to Aikoh Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 256,561, Oct. 12, 1988, abandoned. This application Jul. 31, 1989, Ser. No. 388,023

Int. Cl.[5] A61K *31/78*

U.S. Cl. 424—76.1 3 Claims

1. A deodorant composition in the form of a gel, which comprises 2% to 30% by weight of sodium polyacrylate or ammonium polyacrylate having a molecular weight of from 40,000 to 300,000, 1% to 10% by weight of diglycidyl ether or polyglycidyl ether, 5% to 40% by weight of deodorizer containing as active ingredients ethanaminium N-(carboxymethyl)-2-hydroxy-N,N,bis(2-hydroxyethyl) chloride, diethanolamine, triethanolamine, glyoxal, sodium citrate and sodium dihydrogen phosphate, and the remainder of water.

5,009,888

THERAPEUTIC ENZYME-ANTIBODY COMPLEXES

Joseph T. Dunn, Holliston, Mass., assignor to Genzyme Corporation, Cambridge, Mass.

Filed Apr. 13, 1987, Ser. No. 37,862

Int. Cl.[5] A61K *37/54, 39/395;* C12N *9/96*

U.S. Cl. 424—94.3 2 Claims

1. A pharmaceutical composition comprising a suitable carrier and a complex of the enzyme human tissue plasminogen activator and a monoclonal antibody specific for said enzyme, said antibody being bound to said enzyme by immunoaffinity, the K_D of said antibody/enzyme complex being at least 10^{-11}M, said antibody being bound to said enzyme at a site on said enzyme which does not substantially interfere with the activity of said enzyme and which increases the in vivo half-life of said enzyme.

2. A pharmaceutical composition comprising a suitable carrier and a complex of the enzyme human tissue plasminogen activator and a monoclonal antibody specific for said protein, said antibody being covalently bonded to said enzyme at a site on said enzyme which does not substantially interfere with the activity of said enzyme and which increases the in vivo half-life of said enzyme.

5,009,889

TREATMENT OF DYSFUNCTIONAL VASCULAR ENDOTHELIUM USING ACTIVATED PROTEIN C

Fletcher B. Taylor, Jr., and Charles T. Esmon, both of Oklahoma City, Okla., assignors to Oklahoma Medical Research Foundation, Oklahoma City, Okla.

Filed Dec. 31, 1987, Ser. No. 139,922
Int. Cl.[5] A61K *37/547, 37/02*
U.S. Cl. 424—94.64 20 Claims

1. A pharmaceutical composition comprising:
an effective amount of a polypeptide characterized by activated protein C activity to inhibit inflammatory stimuli disrupting cell permeability and normal coagulation processes in a patient suffering from a dysfunction of endothelial cells; and
a pharmaceutically acceptable carrier.

5,009,890

BURN TREATMENT PRODUCT

Ascanio G. DiPippo, Middletown, R.I., assignor to Trilling Medical Technologies, Inc., Carlstadt, N.J.

Continuation of Ser. No. 83,395, Aug. 10, 1987, abandoned, which is a continuation-in-part of Ser. No. 32,268, Mar. 31, 1987, abandoned. This application Apr. 11, 1990, Ser. No. 512,621
Int. Cl.[5] A61K *35/78;* A61L *15/44*
U.S. Cl. 424—195.1 48 Claims

1. A burn treatment product in the form of a gel comprising:
an effective amount of water for permitting formation of a gel and for reducing the amount of heat in the burned are; between about 0.1 and 20% Tea Tree Blend; and
a gel forming amount of at least one gum.

5,009,891

ANTIOXIDANT COMPOSITION OF NATURAL PRODUCTS AND PRODUCING METHOD THEREOF

Kozo Niwa, 4-4, Asahi-machi, Tosa-Shimizu, Kochi, and Shimesu Motoyama, Asaka, both of Japan, assignors to Kozo Niwa, Kochi, Japan

Filed Sep. 23, 1987, Ser. No. 100,166
Claims priority, application Japan, Sep. 25, 1986, 61-224791
Int. Cl.[5] A61K *35/78*
U.S. Cl. 424—195.100 13 Claims

1. An antioxidant composition, which comprises; the product obtained by steps consisting of
(a) heating a material selected from the group consisting of plant seeds, vegetable grains and germs thereof, or rice bran to a temperature within the range of from 50° to 150° C. for a period of time sufficient to release low-molecular weight antioxidant compounds from bonds or repeating sub-units of polymers binding the compounds to other components or each other;
(b) brewing the heated material; and
(c) adding to the brew, an oil, obtained from a plant heated to a temperature within the range of from 50° to 150° C. for a period of time sufficient to release low-molecular weight antioxidant compounds from bonds or repeating sub-units of polymers binding the compounds to other components or each other.

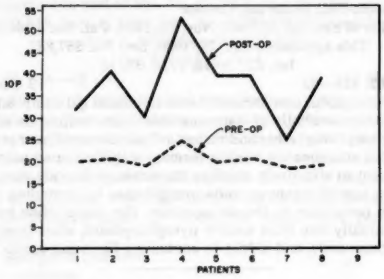
5,009,892

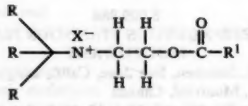
RAPID MIOSIS WITH CONTROL OF INTRAOCULAR PRESSURE

James W. McKinzie, 3124 Solimar Beach Dr., Ventura, Calif. 93001

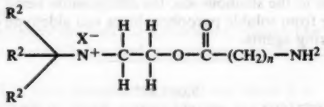
Filed Mar. 3, 1989, Ser. No. 318,753
Int. Cl.[5] A61K *9/00*
U.S. Cl. 424—422 22 Claims

1. A method of inducing quick miosis while controlling intraocular pressure in a mammal during ocular surgery comprising the steps of:
applying to the eye of the mammal during ocular surgery an aqueous solution containing from 0.1 to 5% by weight of a first miotic agent dissolved in a pharmacologically acceptable aqueous carrier, said first agent being selected from compounds of the formula:





where R and R^1 are lower alkyl groups containing 1 to 5 carbon atoms and X^- is an anion; and
applying to the eye during said surgery an aqueous saline solution containing 0.001 to 1.0 percent by weight of a second miotic agent dissolved in pharmacologically acceptable aqueous carrier selected from compounds of the formula:



where R^2 is a lower alkyl group of 1–5 carbon atoms, n is an integer from 0–3 and X^- is an anion.

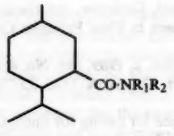
5,009,893

BREATH-FRESHENING EDIBLE COMPOSITIONS OF METHOL AND A CARBOXAMIDE

Subraman R. Cherukuri, Towaco; Krishna Raman, Randolph, both of N.J.; Gul Mansukhani, Staten Island, N.Y.; Ralph Cifrese, Wharton, N.J., and Lucy L. Wong, Jackson Heights, N.Y., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Jul. 17, 1989, Ser. No. 381,218
Int. Cl.[5] A61K *7/16, 9/68*
U.S. Cl. 424—440 30 Claims

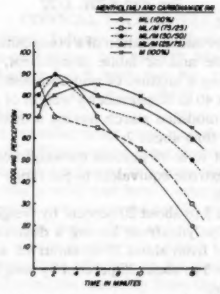
1. A chewing gum composition capable of providing long-lasting, breath freshening perception without bitterness comprising a gum base, a sweetener and a cooling composition comprising menthol and an N-substituted-p-menthane carboxamide of the formula:



wherein R_1, when taken separately, is selected from the

group consisting of hydrogen, and an aliphatic radical containing up to 25 carbon atoms;

R_2, when taken separately is selected from the group consisting of a hydroxy radical, and an aliphatic radical containing up to 25 carbon atoms, with the proviso that when R_1



is hydrogen R_2 may also be an aryl radical of up to 10 carbon atoms and selected from substituted phenyl, phenalkyl, naphthyl and substituted naphthyl, and pridyl; and R_1 and R_2 when taken together, represent a cyclic or heterocyclic group of up to 25 carbon atoms.

5,009,894

ARRANGEMENT FOR AND METHOD OF ADMINISTERING A PHARMACEUTICAL PREPARATION

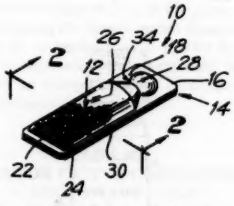
Charles Hsiao, Copper City, Fla., assignor to Baker Cummins Pharmaceuticals, Inc., Miami, Fla.

PCT No. PCT/US88/00868, § 371 Date May 11, 1988, § 102(e) Date May 11, 1988

PCT Filed Mar. 7, 1988, Ser. No. 227,904

Int. Cl.[5] A61K *9/52*

U.S. Cl. 424—451 **21 Claims**



1. An arrangement for administering a pharmaceutical preparation, comprising:

a multitude of pellets containing a pharmaceutical preparation and having non-tacky coatings; and

a breakable packet including a backing sheet having opposite major planar surfaces, and a covering member overlying the backing sheet, and extending outwardly of, and having a flange portion sealed to one of said major surfaces, said covering member bounding with the backing sheet a compartment in which the pellets are contained, said covering member including a hollow main portion having a predetermined half-cylindrical cross-section and extending along a longitudinal direction, a neck portion having a half-frusto-conical cross-section less than said predetermined cross-section and tapered walls which converge toward each other along the longitudinal direction to a waist, and a head portion having a half-spherical cross-section and tapered walls which diverge apart along the longitudinal direction away from the waist, said covering member having its smallest dimension, as considered along a transverse direction generally perpendicular to the longitudinal direction, at the waist, said packet having across the waist a frangible zone which, when broken, forms the neck portion as a tapered pouring spout through which the pellets are poured from the compartment.

5,009,895

SUSTAINED RELEASE WITH HIGH AND LOW VISCOSITY HPMC

Chung Y. Lui, Lansdale, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Feb. 2, 1990, Ser. No. 473,801

Int. Cl.[5] A61K *9/20*

U.S. Cl. 424—465 **11 Claims**

1. A carrier base material combined with a therapeutically active medicament and shaped and compressed to a solid sustained release pharmaceutical dosage form having a zero order release profile upon administration, carrier base material comprising:

(a) a high viscosity HPMC; having a molecular weight of 60,000 or greater; and

(b) a low viscosity HPMC, having a molecular weight of 50,000 or less, wherein the high and low viscosity HPMC are in a ratio yielding a zero order release profile.

5,009,896

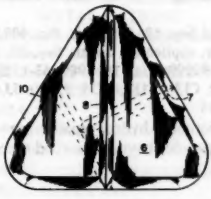
MULTI-FRACTIONABLE TABLET STRUCTURE

John W. Becker, Littleton, Colo., assignor to Akzo N.V., Arnhem, Netherlands

Filed Oct. 4, 1989, Ser. No. 416,902

Int. Cl.[5] A61K *9/44*

U.S. Cl. 424—467 **7 Claims**



1. A pharmaceutical tablet that is readily divisible into subdosage units of two or three equal parts, said tablet comprising (i) an equilateral or isosceles triangle shape, (ii) two opposite triangular planar surfaces each having scoremarkings thereon, (iii) the scoremarkings on one surface consisting of a first scoremarking extended perpendicularly from the midpoint of one edge of the triangle and a second scoremarking positioned perpendicular to the first scoremarking at its distal end, wherein the length of the first scoremarking is selected such that the two perpendicular scoremarkings divide the tablet into three equal parts and (iv) a single scoremarking on the second surface dividing the tablet into two equal parts, wherein the scoremarking on the second surface is located to extend from an angle adjacent to the edge from which the first scoremarking on the opposite side extended or located to extend from the midpoint of the same edge, from which the first scoremarking, on the opposite side extended to the midpoint of the opposite angle.

5,009,897

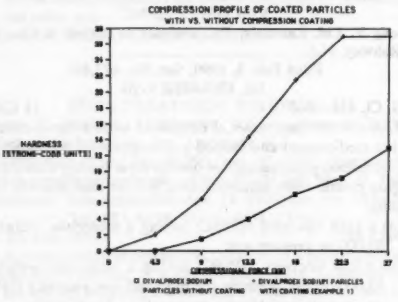
PHARMACEUTICAL GRANULES AND TABLETS MADE THEREFROM

Dale R. Brinker, Antioch, and Thomas L. Reiland, Gages Lake, both of Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

Continuation of Ser. No. 353,809, May 22, 1989, abandoned, which is a continuation-in-part of Ser. No. 211,495, Jun. 24, 1988, abandoned. This application Jul. 12, 1990, Ser. No. 552,377

Int. Cl.[5] A61K *9/16, 9/26, 9/28*

U.S. Cl. 424—469 11 Claims


COMPRESSION PROFILE OF COATED PARTICLES
WITH VS. WITHOUT COMPRESSION COATING
HARDNESS (STRONG-COBB UNITS)
COMPRESSIONAL FORCE (KN)
DIVALPROEX SODIUM PARTICLES WITHOUT COATING
DIVALPROEX SODIUM PARICLES WITH COATING (EXAMPLE 1)

1. A granule for compression into tablets having a hardness sufficient to produce a cohesive tablet that will not fracture during tablet coating, comprising a core of active drug and a surface coating comprising a polymer selected from povidone, hydroxypropyl cellulose and hydroxypropyl methylcellulose and microcrystalline cellulose, the polymer:microcrystalline cellulose ratio being from about 1:15 to about 2:1 by weight.

5,009,898

ANTIMICROBIAL HYDROXYAPATITE POWDERS AND METHODS FOR PREPARING THEM

Shuji Sakuma; Kiminori Atsumi, and Keijiro Fujita, all of Tokyo, Japan, assignors to Kabushiki Kaisha Sangi, Tokyo, Japan

Filed Sep. 19, 1989, Ser. No. 409,076

Claims priority, application Japan, Sep. 29, 1988, 63-242389; Apr. 14, 1989, 1-92999; May 18, 1989, 63-122958

Int. Cl.[5] A61K *33/38, 33/30, 33/34*

U.S. Cl. 424—618 4 Claims

1. An antimicrobial hydroxyapatite powder comprising hydroxyapatite powder having absorbed therein silver ions.

5,009,899

WHEY PERMEATE-DERIVED SWEETENER

Bill L. Miller, Fort Dodge; H. Bruce Perry, Webster City, and Robert DeGregorio, Fort Dodge, all of Iowa, assignors to Land O'Lakes, Inc., Arden Hills, Minn.

Continuation-in-part of Ser. No. 116,978, Nov. 5, 1987, abandoned. This application May 10, 1989, Ser. No. 350,121

Int. Cl.[5] A23K *1/08*

U.S. Cl. 426—2 16 Claims

1. A method of feeding animals comprising:

providing a whey permeate sweetener including fibrous carrier and a condensed whey permeate in an amount sufficient to coat the fibrous carrier the whey permeate having at least 10% caramelized lactose and having a protein level of less than approximately 8% and a lactose level of at least approximately 79%, on a dry matter basis by weight applied to the fibrous carrier; and

feeding the sweetener to animals.

5,009,900

GLASSY MATRICES CONTAINING VOLATILE AND/OR LABILE COMPONENTS, AND PROCESSES FOR PREPARATION AND USE THEREOF

Harry Levine; Louise Slade, both of Morris Plains; Bernhard Van Lengerich, Ringwood, and John G. Pickup, Randolph, all of N.J., assignors to Nabisco Brands, Inc., East Hanover, N.J.

Filed Oct. 2, 1989, Ser. No. 415,867

Int. Cl.[5] A23L *1/22*

U.S. Cl. 426—96 54 Claims

1. A process for encapsulation of a composition containing at least one volatile and/or labile component, which process comprises forming a mixture of said composition with:

(a) from about 40 to 80 percent by weight of a water-soluble, chemically-modified starch having a dextrose equivalent not greater than about 2;

(b) from about 10 to 40 percent by weight of a maltodextrin having a dextrose equivalent in the range of from about 5 to about 15;

(c) from about 5 to about 20 percent by weight of corn syrup solids or a polydextrose having a dextrose equivalent in the range of from about 21 to about 42; and

(d) from about 5 to about 20 percent by weight of a mono- or disaccharide,

all of said percentages being based upon the total weight of said components (a), (b), (c) and (d);

and extruding the mixture to form a glassy matrix having a glass transition temperature of at least 40° C. wherein the composition containing at least one volatile and/or labile component is encapsulated.

25. A glassy matrix produced by a process according to claim 1.

5,009,901

METHOD OF PACKAGING A BEVERAGE AND A BEVERAGE PACKAGE

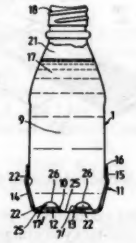
William J. Byrne, Mount Merrion, Ireland, assignor to Arthur Guinness Son & Company (Dublin) Limited, Dublin, Ireland

Filed Apr. 28, 1989, Ser. No. 345,639

Claims priority, application United Kingdom, Sep. 12, 1988, 8821265

Int. Cl.[5] B65D *85/72;* B65B *31/00, 81/20*

U.S. Cl. 426—112 12 Claims



1. A beverage package comprising a container body having an operable top that communicates with a sealed primary chamber in the container body which is charged with beverage containing gas in solution to provide a primary headspace therein, said headspace having a pressure greater than atmospheric; a bottom wall portion of the container body which has a restricted orifice therein; a closure wall sealed to the exterior of the container body to form therewith a sealed secondary chamber that is in constant communication with the primary chamber through said restricted orifice; said secondary chamber being charged with beverage derived from the primary chamber by way of the restricted orifice to provide a secondary headspace in the secondary chamber which secondary headspace has a pressure greater than atmospheric when the contents of the package are at equilibrium so that when the

beverage package is opened at said openable top, the primary headspace reduces to atmospheric pressure and pressure in the secondary headspace causes beverage from the secondary chamber to be ejected by way of the restricted orifice into the beverage in the primary chamber for forming a head of froth on said beverage in the primary chamber.

5,009,902
CONICAL TACO SHELL
Carlos A. Mercenari, Toltecas 39 0900, Mexico
Continuation-in-part of Ser. No. 840,518, Mar. 17, 1986. This application Jul. 7, 1988, Ser. No. 216,345
Int. Cl.[5] A21D *13/00*
U.S. Cl. 426—138 6 Claims

1. Process of manufacturing cone-taco-shells which comprises the steps of rolling cooked heart shaped tortilla to form a cylinder placing said cylinder in a cone shaped sheet metal envelope; inserting a solid and heavy metallic cone into the sheet metal envelope containing the tortilla to hold the tortilla between said outside metal sheet and the solid metal cone; submerging the whole assembly in which cooking oil preheated to a temperature effective to fry the tortilla in a few seconds and removing the assembly from the oil and allowing it to cool.

5,009,903
METHOD OF MAKING FRIED PIE
Mario P. deFigueiredo, Chesterfield, Mo., and Richard L. Brady, Belleville, Ill., assignors to DCA Food Industries, Inc., New York, N.Y.
Filed Feb. 2, 1988, Ser. No. 151,405
Int. Cl.[5] A21D *8/00*
U.S. Cl. 426—243 14 Claims

1. A process for preparing a fried pie in the nature of a microwavable, pre-fried, batter-coated dough-enrobed foodstuff comprising the steps of:

(a) providing a foodstuff enrobed with uncooked dough and providing an aqueous batter slurry formed by mixing an effective amount of water with a farinaceous-based batter mix comprising a farinaceous material selected from the group consisting of starch, flour, and mixtures thereof;

(b) applying said batter slurry to the uncooked dough of the dough-enrobed foodstuff to coat the same; and

(c) partially cooking the batter-coated dough-enrobed foodstuff in hot fat or cooking oil to pre-fry the same;

said pre-fried batter-coated dough-enrobed foodstuff being characterized by an acceptable level of crispness after being subjected to microwave cooking.

5,009,904
METHOD FOR FRYING COMESTIBLES IN A MICROWAVE OVEN
Irving M. Saslaw, Woodcliff Lake, N.J.; Harry H. Topalian, Weston, Conn., and Joseph M. Rispoli, Massapequa Park, N.Y., assignors to Saslaw & Topalian Associates, Inc., Port Chester, N.Y.
Division of Ser. No. 440,800, Nov. 24, 1989. This application Oct. 1, 1990, Ser. No. 590,963
Int. Cl.[5] A23L *1/00*
U.S. Cl. 426—243 28 Claims

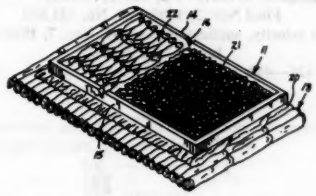
1. A method for frying comestibles in a microwave oven comprising the steps of:

(a) contacting said comestible with a microwave cooking composition comprising from about 30 to 95 percent by weight of a frying oil or fat, up to about 30 percent by weight of a water- or oil-soluble food gum, and from about 0.05 to 2.5 percent by weight of an emulsifier; and

(b) applying microwave energy to said comestible while in contact with said cooking composition,

with the proviso that said food gum is present in said cooking composition in an amount sufficient to enhance the formation of a foam during the application of said microwave energy while stabilizing the thus-formed foam, whereby a fried comestible is obtained.

5,009,905
SUSHI FORMING METHOD
Takeo Ikeda, 1687-A Kalawi Dr., Wailuku, Hi. 96793
Filed Feb. 28, 1990, Ser. No. 486,290
Int. Cl.[5] A23L *1/00*
U.S. Cl. 426—297 2 Claims



1. A method of gauging and forming sushi comprising the steps of:

a. providing a bamboo mat defined by a predetermined upper surface and positioning the mat on a support surface, and

b. placing a flexible seaweed sheet on said bamboo mat, said flexible seaweed sheet defined by a further surface less than that of the predetermined surface of the bamboo mat, and

c. providing a frame member and positioning the frame member onto an upper surface of the seaweed sheet, and

d. forming a layer of rice within the frame member, and

e. forming a layer of seafood overlying the layer of rice to completely fill the frame member, and

f. removing the frame member, and

g. rolling the bamboo mat, the seaweed sheet, rice and seafood in unison to form a sushi roll.

5,009,906
METHOD AND COMPOSITION FOR FILTERING BEER, ALE OR MALT LIQUOR TO REDUCE MULTIVALENT METAL CATIONS
Timothy R. Smith, Santa Barbara, Calif., assignor to Manville Corporation, Denver, Colo.
Filed Jun. 19, 1990, Ser. No. 540,097
Int. Cl.[5] C12H *1/04*
U.S. Cl. 426—330.4 13 Claims

1. A method of reducing multivalent metal cations from beer, ale or malt liquor comprising the steps of:

providing an alkali metal silicate-treated finely divided diatomaceous earth (DTE), and

contacting the beer, ale or malt liquor with the silicate-treated DTE by filtering the beer through the silicate-treated DTE thereby reducing the multivalent metal cation content of the beer, ale or malt liquor.

5,009,907
METHOD FOR TREATING FOOD TO CONTROL THE GROWTH OF YEASTS
Masahiro Fujii, Tokyo; Masakazu Hatakeyama, Minamatashi, and Jun Hiraki, Yokohamashi, all of Japan, assignors to Chisso Corporation, Japan
Filed Jun. 26, 1989, Ser. No. 371,008
Claims priority, application Japan, Jul. 7, 1988, 63-169233
Int. Cl.[5] A23L *3/3463*
U.S. Cl. 426—335 12 Claims

1. A method of treating food to control the growth of yeasts comprising adding ethanol preparations to food, wherein the ethanol preparations comprise a solution of ε-polylsine in etha-

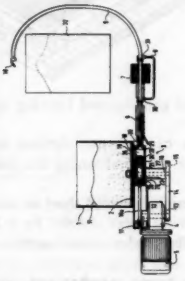
nol having an ethanol concentration of 30% by weight or higher.

5,009,908

METHOD OF PELLETING DRY PELLETS FROM A MIXTURE CONTAINING THERMO-HARDENED INGREDIENTS, PARTICULARLY FOR USE AS FISH FEED, AND THE MACHINE FOR CARRYING OUT THE PROCESS

Ole Molaug, Bryne, and Steinar Risa, Undheim, both of Norway, assignors to Akva A/S, Bryne, Norway

Filed Nov. 2, 1989, Ser. No. 431,553
Claims priority, application Norway, Nov. 7, 1988, 884953
Int. Cl.[5] A23B *4/03*
U.S. Cl. 426—454 24 Claims



1. A method of forming dry pellets from a mass, including a dry mass, containing thermo-hardening substances, particularly for use as fish feed, comprising the steps of:

first compressing the mass;

next heating the compressed mass to a thermo-hardening temperature;

draining off the by-product of heating, such as fat, other liquids and gas before performing said cooling step;

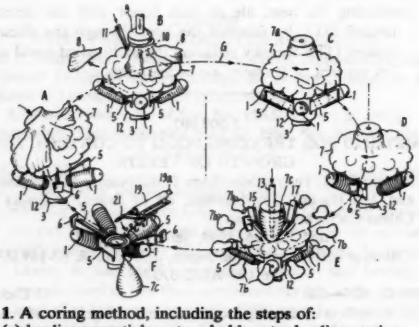
finally cooling the thermo-hardened mass and bringing the drained by-products into contact with the thermo-hardened mass after the latter has been cooled off in said cooling step.

5,009,909

CORING METHOD

Thomas W. Hirtle, San Ramon; Frederick J. Cimperman, Castro Valley, and Klaus Silbermann, Sunol, all of Calif., assignors to Ashlock Company, San Leandro, Calif.

Filed Aug. 5, 1988, Ser. No. 229,160
Int. Cl.[5] A23N *3/00*
U.S. Cl. 426—481 11 Claims



1. A coring method, including the steps of:

(a) loading an article onto a holder at a loading station;

(b) translating the holder, with the article thereon, along a process path from the loading station to a coring station; and

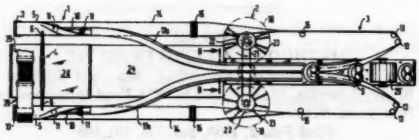
(c) at the coring station, translating a pivot arm assembly, and a coring knife attached to the pivot arm assembly, along a first axis to translate the coring knife into engagement with the article, while rotating the pivot arm assembly about the first axis and pivoting the pivot arm assembly about a second axis, to translate the coring knife along a generally helical coring path with varying radius as the coring knife penetrates the article, thereby severing fragments of the article from a one-piece core of the article.

5,009,910

METHOD OF FORMING PRETZELS FROM STRANDS OF DOUGH

Horst Zwicker, Grabenstrasse 22, 7320 Göppingen, Fed. Rep. of Germany

Filed Feb. 7, 1990, Ser. No. 477,344
Claims priority, application Fed. Rep. of Germany, Feb. 8, 1989, 3903701
Int. Cl.[5] A21D *3/08*
U.S. Cl. 426—499 7 Claims



1. A method of forming pretzels from strands of dough, comprising the steps of:

grasping an oncoming dough strand in a receiving station at its ends;

moving the ends of each dough strand toward each other during transport of the dough strand from the receiving station to a knot forming station, whereby the remaining portion between the ends is lowered below the ends to define a bow-shaped loop with a central portion and opposing side portions;

turning the bow-shaped loop in the knot forming station about a vertical axis relative to the ends by 360° to form a knot;

upwardly folding the bow-shaped loop about a horizontal axis below the knot into a horizontal position below the ends during transport of the dough strand from the knot forming a station to a release station; and

releasing the ends of the dough strand in the release station to allow the ends to sink onto the side portions by virtue of their own weight,

wherein the dough strands are continuously advanced in conveying direction at arbitrary distance from each other between the receiving station, the knot forming station and the release station, without stoppage during said turning step in the knot forming station.

5,009,911

FOODSTUFF CONTAINING AEWX STARCH

David J. Mauro, Dolton, Ill.; Susan L. Furcsik, Lake Station; Frances R. Katz, Crown Point, both of Ind.; Eugene J. Faron, II, Valpargiso, Ind.; David J. Gottneid, Griffith, Ind., and Frank J. Pustek, Munster, Ind., assignors to American Maize-Products Company, Hammond, Ind.

Filed Aug. 18, 1989, Ser. No. 395,761
Int. Cl.[5] A23L *1/0522*
U.S. Cl. 426—578 19 Claims

1. A thickened acid foodstuff comprising a foodstuff, water, and a starch extracted from a starch-bearing plant having an amylose extender waxy genotype, said acid foodstuff having a pH of about 5.0 and below, said amylose extender waxy starch

being present in an amount effective to provide thickening characteristics to said acid foodstuff after said acid foodstuff is retorted, and wherein said thickened acid foodstuff exhibits substantially similar viscosity characteristics as a thickened foodstuff made using an effective amount of a crosslinked waxy starch extracted from the same type of starch-bearing plant from which said amylose extender waxy starch is extracted, said crosslinked waxy starch also being present in an amount effective to provide thickening characteristics to a thickened acid foodstuff made with the crosslinked starch, and said viscosity being measured by a Brabender amylogram.

5,009,912

METHOD OF MAKING A MILK FORMULATION

Floyd K. Nixon, 516 Ellis Dr., Paris, Tenn. 38242

Continuation-in-part of Ser. No. 369,628, Jun. 20, 1989, abandoned. This application May 21, 1990, Ser. No. 525,695
Int. Cl.[5] A23C *9/137*
U.S. Cl. 426—580 2 Claims

2. A milk composition that approaches the taste, mouth-feel and appearance of whole milk which consists essentially of a mixture of skim milk or low fat milk and

(A) 0.18–0.80% by weight base on the weight of the milk of a colloidal grade of microcrystalline cellulose or peptized microcrystalline cellulose which consists of a mixture of

(a) 88–89% by weight of microcrystalline cellulose and

(b) 11–12% by weight of carboxy-methyl cellulose and

(B) 0.1–1.0% by weight based on the weight of the milk of gum arabic.

5,009,913

CHEESE-LIKE SPREAD COMPOSITION AND METHOD OF MAKING

Salah H. Ahmed, Elk Grove Village, and Anthony J. Luksas, Downers Grove, both of Ill., assignors to Dairy Research, Inc., Rosemont, Ill.

Filed Aug. 30, 1989, Ser. No. 400,391
The portion of the term of this patent subsequent to Sep. 6, 2005, has been disclaimed.
Int. Cl.[5] A23C *19/09, 15/06*
U.S. Cl. 426—581 17 Claims

1. A cheese-like spread composition which has the taste, texture and mouth feel of a cheese food composition, comprising a homogenized concentrated mixture of (a) at least one water-in-oil emulsion of a liquid dairy product, (b) at least one oil-in-water emulsion of a liquid dairy product, and (c) at least one cheese composition, wherein the ratio of (a) to (b) is at least 6:4 but is less than 9:1, the ratio of (a) and (b) to (c) is between 9:1 and 1:4, and the total fat content of the composition is at least 40% and wherein the starting liquid dairy product is primarily an oil-in-water emulsion in the natural state.

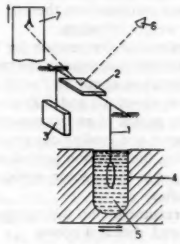
5,009,914

PROCESS FOR CONFERRING CHEESE MAKING PROPERTIES ON OVERHEATED MILKS FOR THE MANUFACTURE OF RENNETED CHEESES

Michel Serpelloni, Beuvry les Bethune, France, assignor to Roquette Freres, Lestrem, France

Filed Jun. 14, 1989, Ser. No. 365,571
Claims priority, application France, Jun. 14, 1988, 88 07932
Int. Cl.[5] A23C *19/04*
U.S. Cl. 426—582 5 Claims

1. In a process for making cheese from milk, wherein curd is formed under the action of rennet on the milk, the said process comprising heat treating the milk at a temperature from 78°to 110° C., the improvement comprising incorporating into the milk an amount of from 0.03 to 5 g per liter of milk of an acidogenic agent selected from the group consisting of



gluconolactones and glucoheptonolactones whereby cheese making properties are conferred on the milk.

5,009,915

METHOD FOR PREPARING KONJAK CHIP

Ikuzo Ogawa, Kanagawa, Japan, assignor to Kabushiki Kaisha Maruzen Shokuhin, Kanagawa, Japan

Filed May 25, 1989, Ser. No. 356,987
Claims priority, application Japan, Mar. 6, 1989, 1-052119
Int. Cl.[5] A23L *1/00*
U.S. Cl. 426—615 1 Claim

1. A process for making a konjak chip comprising the steps of:

(a) pulverizing konjak between vertically oriented revolving whetstones to about 1–50 mm in length and 0.5–3 mm in width;

(b) deodorizing the pulverized konjak by steaming or boiling; and

(c) dehydrating the deodorized konjak to about 10–60 % of its original weight.

5,009,916

PSYLLIUM MUCILLOID FIBER FOOD PRODUCTS

John A. Colliopoulos, Evanston, Ill., assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 677,633, Dec. 3, 1984, abandoned, which is a continuation-in-part of Ser. No. 542,450, Oct. 17, 1983, abandoned, which is a continuation-in-part of Ser. No. 560,720, Dec. 12, 1983, abandoned. This application Aug. 7, 1985, Ser. No. 763,118
Int. Cl.[5] A23L *1/526, 1/308;* A23P *1/14*
U.S. Cl. 426—615 10 Claims

1. An expanded high fiber bar or puff made by aqueous extrusion comprising about 5 to 80 weight percent of psyllium mucilloid, water, about 0 to 30 weight percent expander, and a total dietary fiber of from about 4 to 80 weight percent wherein the psyllium mucilloid may be a part of the dietary fiber, and wherein further said high fiber bar or puff comprises one or more dietary fibers selected from cereal brans.

5,009,917

METHOD FOR PRODUCING DEEP RED AND BLACK COCOA

Matthew J. Wiant, Dover; William R. Lynch, Milford, both of Del., and Robert C. LeFreniere, Bethel, Conn., assignors to Kraft General Foods, Inc., Glenview, Ill.

Filed Dec. 18, 1989, Ser. No. 452,188
Int. Cl.[5] A23L *1/272, 2/38*
U.S. Cl. 426—631 22 Claims

1. A method for producing a colored, powdered-dutched cocoa comprising the steps of:

(a) subdividing cocoa press cake to obtain particles which will pass through a No. 4 U.S. Standard Sieve;

(b) adding the subdivided cocoa and an aqueous alkali solu-

tion to a reactor, said solution being present in an amount effective to provide an initial moisture content within the reactor of from 5 to 60% by weight and a level of alkali, selected from the group consisting of carbonate, bicarbonate, hydroxide and combinations thereof, of from 1 to 12% based upon the weight of cocoa;

(c) mixing the contents of the reactor for between about 5 and 180 minutes while maintaining the reactor contents at a temperature between about 150° and 300° F. and at a pressure between about 10 and 200 p.s.i., said pressure being effected by means of an oxygen-containing gas;

(d) venting the reactor and feeding oxygen-containing gas to the reactor during the reaction period in order to effect headspace changes in the reactor at the rate of at least 3 per hour; thereafter,

(e) releasing the pressure within the reactor; and then,

(f) drying the colored, dutched cocoa.

5,009,918

REFORMED FISH PRODUCTS

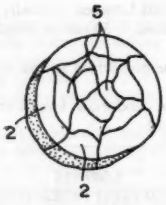
Noël Clairouin, Condette; Alain Gueroult, Lamartine, both of France, and Remi Lemoyne, Vevey, Switzerland, assignors to Nestec S.A., Vevey, Switzerland

Division of Ser. No. 399,817, Aug. 29, 1989, Pat. No. 4,948,620. This application Apr. 27, 1990, Ser. No. 516,052

Claims priority, application European Pat. Off., Sep. 14, 1988, 88114994.2

Int. Cl.[5] A23L *1/325*

U.S. Cl. 426—643 **6 Claims**



1. A frozen reformed fish product in the form of a sausage comprising a plurality of compressed raw boneless fish fillets with skin which encompass a plurality of raw boneless fish fillets without skin such that the skin of the fillets with skin forms substantially all of the exterior surface of the product.

5,009,919

FINGER-PRINTING SYSTEMS & METHOD

Anthony E. Vassiliades, 8738 Tanager Woods Dr., Cincinnati, Ohio 45249

Continuation of Ser. No. 938,260, Dec. 5, 1986. This application Mar. 8, 1989, Ser. No. 320,808

Int. Cl.[5] A61B *5/117*

U.S. Cl. 427—1 **10 Claims**

1. A fingerprinting system comprising means capable of releasably retaining a liquid and a liquid composition releasably retained in said means, said liquid composition consisting essentially of a leuco chromogenic compound and an oleophilic solvent therefor, a substrate for receiving fingerprints associated therewith, said substrate being coated on at least a portion of one surface thereof with a color-developing substance capable of reacting with said chromogenic compound to produce a colored reaction product; and polyvalent metallic ions in said liquid composition or on said substrate with said color-developing substance.

6. The method of fingerprinting comprising applying to a member to be fingerprinted a liquid composition consisting essentially of a leuco chromogenic compound and an oleophilic solvent therefor and applying the member to be fingerprinted to a substrate coated at least in the portion thereof to which the member is applied with a color-developing substance capable of reacting with said leuco chromogenic compound to produce a colored reaction product which is a print of the member; and polyvalent metallic ions in said liquid composition or on said substrate with said color-developing substance.

5,009,920

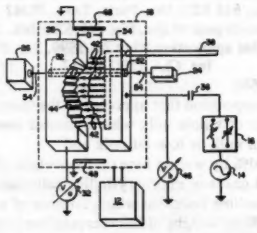
METHOD FOR APPLYING OPTICAL INTERFERENCE COATING

James C. Lee, Plymouth, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Mar. 30, 1990, Ser. No. 502,348

Int. Cl.[5] B05D *3/06*

U.S. Cl. 427—9 **13 Claims**



1. A method for applying high performance multilayer optical interference coatings to a substrate of complex curved topography comprising:

positioning a substrate to be coated in a reaction zone located between first and second electrodes which are shaped to match the contour of said substrate, said reaction zone and said electrodes being within a chamber;

pumping gas components out of said chamber; applying power to said first and second electrodes, resulting in an electromagnetic field between said first and second electrodes;

maintaining a particular pressure within said chamber; and

feeding a substance into said reaction zone through a plurality of orifices in said second electrode, said substance reacting into a plasma of said substance, which in turn results in a plasma enhanced chemical vapor deposition in the form of a thin film upon said substrate.

5,009,921

PROCESS FOR FINISHING LEATHER

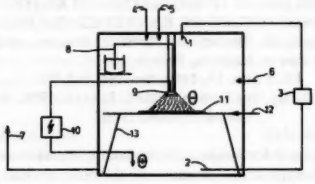
Harro Träubel; Heinrich Strenger, both of Leverkusen; Karl A. Weber, Betzweiler; Hans-Werner Müller, Cologne; Horst Zäpfel, Karlsruhe, and Axel Hummel, Neuffen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Sep. 12, 1989, Ser. No. 405,911

Claims priority, application Fed. Rep. of Germany, Oct. 1, 1988, 3833384

Int. Cl.[5] B05D *1/04, 3/04, 3/10*

U.S. Cl. 427—31 **3 Claims**



1. A process for finishing leather comprising spraying onto

leather in an electrostatic field a finishing liquor having a viscosity at the operating temperature of 500–5,000 cP, the finishing liquor being a spray dispersed from the start in a solvent atmosphere which contains an organic solvent and optionally water and which has a solvent content of 15–90% of the saturation concentration and which has a residual oxygen content of less than 10% by volume.

5,009,922
METHOD OF FORMING A TRANSPARENT CONDUCTIVE FILM

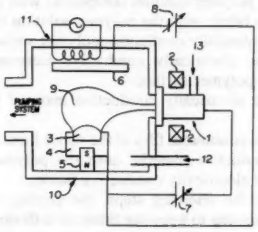
Takeshi Harano; Satoru Takaki; Yuzo Shigesato; Koichi Suzuki; Naoki Hashimoto, all of Yokohama; Hiroyasu Kojima, Ebina, and Takuji Oyama, Yokohama, all of Japan, assignors to Ashahi Glass Company, Ltd., Tokyo, Japan

Filed Mar. 1, 1990, Ser. No. 486,841

Claims priority, application Japan, Mar. 2, 1989, 1-48571; Mar. 14, 1989, 1-59573; Mar. 28, 1989, 1-73955

Int. Cl.[5] B05D *3/06*

U.S. Cl. 427—37 **9 Claims**



1. A method of forming a transparent conductive film characterized in that an arc discharge type plasma produced by arc discharging is generated in an atmosphere wherein the pressure of an atmospheric gas is 3.0×10^{-4} Torr or higher; the plasma is converged onto a vapor deposition material for forming a transparent conductive film to thereby evaporate the vapor deposition material, whereby said transparent conductive film is formed on a substrate located above said vapor deposition material.

5,009,923
METHOD OF FORMING DIAMOND FILM

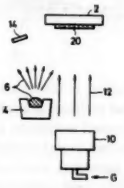
Kiyoshi Ogata; Yasunori Ando, and Eiji Kamijo, all of Kyoto, Japan, assignors to Nissin Electric Co., Ltd., Kyoto, Japan

Continuation of Ser. No. 274,690, Nov. 22, 1988, abandoned, which is a continuation of Ser. No. 43,517, Apr. 28, 1987, abandoned. This application Jun. 27, 1990, Ser. No. 544,800

Claims priority, application Japan, Apr. 28, 1986, 61-98888; Feb. 19, 1987, 62-37576; Apr. 8, 1987, 62-87624

Int. Cl.[5] B05D *3/06*

U.S. Cl. 427—38 **8 Claims**



1. A method of forming a diamond film on a substrate, comprising the steps of:

depositing carbon from an evaporation source onto said substrate in vacuum by vapor deposition to provide a carbon film on the substrate; and

irradiating accelerated ions having an energy of less than 40 KeV onto said substrate, said ions being obtained by ionizing a gas composed of at least one of a hydrogen gas, inert gases, and silicon base gases.

5,009,924
PROCESS TO PERMIT IMPROVEMENT OF FUNCTIONAL PROPERTIES OF POLYOLEFIN ARTICLES BY ELECTRON-BEAM INITIATED POLYMERIZATION

John E. Wyman, Westford, Mass., assignor to Energy Sciences Inc., Wilmington, a part interest and Marjorie T. Wyman, Westford, both of, Mass.

Division of Ser. No. 254,817, Oct. 7, 1988, abandoned, which is a division of Ser. No. 110,472, Oct. 19, 1987, Pat. No. 4,803,126. This application Oct. 27, 1989, Ser. No. 427,372

Int. Cl.[5] B05D *3/06, 3/00*

U.S. Cl. 427—44 **1 Claim**

1. A process for modifying the surface of a polyolefin film that comprises, hydrolyzing an organofunctional silane; coating the surface of a polyolefin film with the hydrolyzed silane and drying the same; and electron-beam irradiating the coated surface to initiate the further polymerization of the silane-to-silane structure in the hydrolyzed silane layer and also to graft the same to the polyolefin surface.

5,009,925
PROCESS FOR THE PRODUCTION OF MAGNETIC RECORDING CARRIERS

Ernst Grigat, Leverkusen; Walter Meckel, Neuss-Uedesheim, and Burkhard Nippe, Munich, all of Fed. Rep. of Germany, assignors to Agfa Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

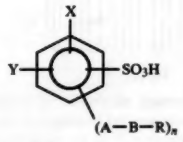
Continuation of Ser. No. 86,851, Aug. 19, 1987, abandoned. This application Oct. 5, 1988, Ser. No. 256,131

Claims priority, application Fed. Rep. of Germany, Aug. 30, 1986, 3629606

Int. Cl.[5] B05D *3/00;* **G11B** *23/00*

U.S. Cl. 427—48 **5 Claims**

1. A process for the production of magnetic recording carriers by the preparation of a dispersion consisting essentially of finely divided magnetic pigments, a dispersing agent and a solution of a polymeric binder in an organic solvent and an isocyanate-compound as cross-linking agent for the polymeric binder and application of the dispersion to a non-magnetizable layer support followed by orientation of the magnetic pigment by means of a magnetic field and drying of the applied layer, wherein the dispersing agent used consists of at least one compound containing one reactive group which produces a firm bond to the magnetic pigment and at least one other group reactive to the NCO-groups of a difunctional or higher functional isocyanate consisting of a compound corresponding to the general formula



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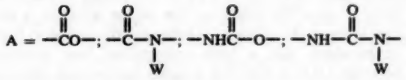
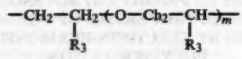
wherein



n=1 or 2

W=H or an optionally branched alkyl group having 1 to 30 carbon atoms,

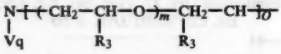
B=a straight chained, optionally branched alkyl group optionally containing hetero atoms, a cycloaliphatic group, or a cycloaliphatic-aromatic group,



wherein

m=1–20,

R_3=H, or CH_3, or



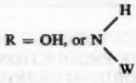
wherein

V=alkyl with 1–30 carbon atoms,

O=1, 2, or 3,

q=0 or 1

O+q=3



X, Y=H, C_1–C_{30}-alkyl or C_1–C_{30}-O-alkyl and X=Y or X≠Y.

5,009,926

METHOD OF FORMING AN INSULATING FILM

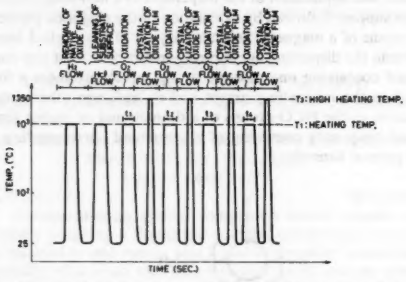
Hisashi Fukuda, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed May 11, 1990, Ser. No. 522,126

Claims priority, application Japan, May 18, 1989, 1-125420

Int. Cl.[5] B05D *3/06*

U.S. Cl. 427—55 **22 Claims**



1. A method of forming an insulating film on a substrate wherein a substrate is cleaned by heating it in an atmosphere of a reducing gas, and heating it in an oxidizing gas, and then heating it in an atmosphere of a gas used to form the film in the same reaction chamber,

characterized by repeating a cycle comprising a heat treatment to grow the insulating film on the substrate, a process wherein the substrate is subsequently cooled to room temperature, and a high temperature heat treament wherein it is then heated to a higher temperature than that used when growing the film in order to crystallize said insulating film, in the same reaction chamber.

5,009,927

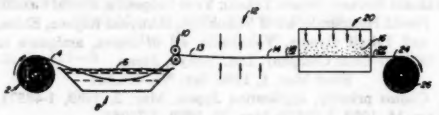
METHOD FOR COATING FABRIC SURFACE WITH ELECTRICALLY CONDUCTIVE FILM

Willard C. Cloyd, Fountain Hills, and Robert M. Nelson, Phoenix, both of Ariz., assignors to Hexcel Corporation, Dublin, Calif.

Filed Nov. 29, 1988, Ser. No. 277,105

Int. Cl.[5] B05D *5/12, 3/00*; C23C *14/34*

U.S. Cl. 427—121 **5 Claims**



1. A method for coating the outer surface of a fabric with an electrically conductive film, the fabric of the type having fibers at its outer surface, comprising the following steps:

selecting a polymer solution compatible with the fabric;

coating the fabric with the polymer solution thereby creating a substantially continuous polymer surface;

selecting an electrically conductive material compatible with the polymer surface;

placing the electrically conductive material into a vapor form;

depositing a continuous film of the vapor form of the electrically conductive material onto the polymer surface to create an electrically conductive fabric;

controlling the selecting steps, the coating step and the depositing step to keep the fabric in a flexible condition.

5,009,928

METHOD FOR FORMING A TRANSPARENT CONDUCTIVE METAL OXIDE FILM

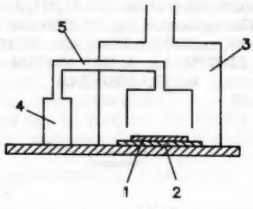
Yutaka Hayashi, Ibaraki; Atuo Itoh, Tokyo; Mizuho Imai, Tokyo, and Hideyo Iida, Tokyo, all of Japan, assignors to Japan as represented by general director of Agency of Industrial Science and Technology; Taiyo Yuden Co., Ltd. and Research Development Corporation of Japan, all of Tokyo, Japan

Filed Mar. 23, 1990, Ser. No. 498,038

Claims priority, application Japan, Mar. 31, 1989, 1-80956

Int. Cl.[5] B05D *5/12*; C03C *17/23*

U.S. Cl. 427—126.3 **11 Claims**



1. A method of forming a transparent conductive metal oxide film with a textured surface on a substrate comprising the steps of contacting a heated substrate at a first temperature with an atomized or gasified metal-containing coating composition to form a coated substrate with a first metal oxide film deposited thereon; heating said coated substrate to a second temperature higher than said first temperature so that a second metal oxide film having a degree of crystal orientation in conformity with that of the first metal oxide film can be formed thereon; and contacting said coated substrate with the atomized or gasified metal-containing coating composition to deposit the second metal oxide film thereon, said second metal

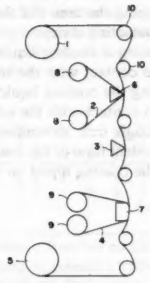
oxide film being of the same composition as said first metal oxide film.

5,009,929

PROCESS FOR THE PREPARATION OF MAGNETIC RECORDING MEDIUM

Shinobu Iida; Masaaki Fujiyama, and Keisuke Yamada, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 181,937, Apr. 15, 1988, abandoned.
This application Mar. 26, 1990, Ser. No. 533,991
Claims priority, application Japan, Apr. 16, 1987, 62-94740
Int. Cl.[5] B05D 5/12
U.S. Cl. 427—130 7 Claims



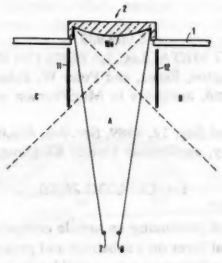
1. A process for the preparation of a magnetic recording medium which comprises the steps of first supercalendering a magnetic recording layer coated on a non-magnetic support, said magnetic recording layer comprising a ferromagnetic powder dispersed in a binder, next abrading the treated surface of said magnetic recording layer by means of an abrasive tape containing an abrasive selected from the group consisting of α-Al_2O_3, SiO_2, Cr_2O_3, α-Fe_2O_3, diamond, ZnO_2, TiO_2, and then wiping the abraded surface of the magnetic recording layer using a nonwoven fabric.

5,009,930

METHOD FOR FORMING A DEPOSITED LAYER ON A SKIRTED SUBSTRATE

Matthew S. Brennesholtz, Waterloo, N.Y., assignor to North American Philips Corporation, New York, N.Y.

Filed Dec. 8, 1989, Ser. No. 448,033
Int. Cl.[5] B05D 7/22; C23C 16/04
U.S. Cl. 427—236 8 Claims



1. A method for reducing the shadowing effect of the skirt of a skirted substrate on the thickness uniformity of a deposited layer on the substrate, said skirt extending in the direction of a primary source of deposited material, the method comprising:

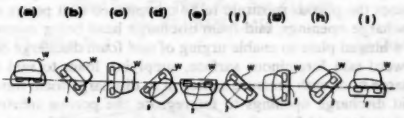
providing at least one shield between the primary source of the deposited material and the substrate to at least partially shield the substrate from secondary indirect sources of deposited material located outside the area of direct flux of the particles from the primary source to the substrate, during deposition.

5,009,931

COATING METHOD

Takakazu Yamane; Yoshio Tanimoto, and Tadamitsu Nakahama, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Aug. 8, 1989, Ser. No. 390,546
Claims priority, application Japan, Aug. 9, 1988, 63-197038
Int. Cl.[5] B05D 3/12
U.S. Cl. 427—195 68 Claims



1. A coating method in a coating line for coating a substrate with a paint in a film thickness thicker than a thickness at which the paint sags to form a highly reflective surface coating on the substrate, comprising:

a spraying step in which the paint is sprayed to form a coat in a film thickness thicker than a thickness at which the paint sags on a surface extending at least upwardly and downwardly; and

a drying step in which the substrate is rotated about its horizontal axis until the paint sprayed thereon achieves a substantially sagless state, the rotation of the substrate being carried out at a speed which is high enough to rotate the substrate from a vertical position to a horizontal position before the paint coated thereon substantially sags due to gravity yet which is low enough so as to cause no sagging as a result of centrifugal force;

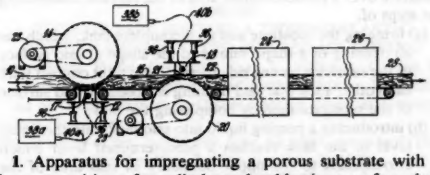
wherein a surface at an edge portion of the substrate to be coated is lower than another portion thereof before the paint is sprayed in the spraying step in a film thickness thicker than the thickness at which the paint sags.

5,009,932

METHOD AND APPARATUS FOR IMPREGNATING A POROUS SUBSTRATE WITH FOAM

Paul A. Klett, Newark; Shiv K. Bakhshi, Columbus, and Steven B. Stahl, Granville, all of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Jun. 14, 1982, Ser. No. 388,284
The portion of the term of this patent subsequent to Apr. 16, 2008, has been disclaimed.
Int. Cl.[5] B05D 1/26, 3/06; B05C 3/00, 3/18
U.S. Cl. 427—243 10 Claims



1. Apparatus for impregnating a porous substrate with a foam comprising a foam discharge head having a surface plate adapted with one or more discharge openings for the discharge of foam therethrough, a foraminous surface positioned opposite said discharge openings to define a nip region, said foraminous surface being adapted t transport the porous substrate through said nip region, means for supplying foam to said foam discharge head with pressure sufficient to discharge foam through said dischharge openings to impregnate the porous

substrate, and means for urging said foam discharge head toward said foraminous surface to apply a force to the porous substrate to urge the porous substrate into sealed relation with said surface plate so that foam is substantially prevented from accumulating at the interface of said foam discharge head and the porous substrate as the porous substrate is transported through said nip region, said foam discharge head being mounted to a hinged plate to enable the urging of said foam dischharge head toward said foraminous surface.

7. A method for impregnating a porous substrate with a foam comprising transporting the porous substrate through a nip region defined by a foraminous surface and a foam discharge head, said foam dischharge head comprising a surface plate adapted with one or more dischharge openings, where the transport of the porous substrate through said nip region causes the porous substrate to be compressed as it passes said discharge openings, said foam discharge head being mounted to a hinged plate to enable urging of said foam discharge head toward said foraminous surface, supplying foam to said discharge head with pressure sufficient to discharge foam though said discharge openings to impregnate the porous substrate, and urging said foam discharge head toward said foraminous surface to apply a force to the porous substrate to urge the porous substrate into sealed relation with said surface plate to substantially prevent foam from accumulating at the interface between said foam discharge head and the porous substrate as the porous substrate is transported through said nip region.

5,009,933

METHOD AND APPARATUS FOR COATING THIN LIQUID FILM ON PLATE SURFACE

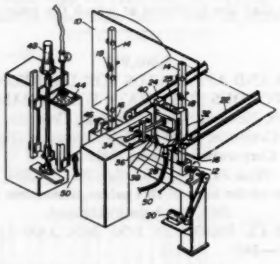
Naohiko Matsuda, Matsusaka, and Kensuke Makita, Mie, both of Japan, assignors to Central Glass Company, Limited, Ube, Japan

Filed Aug. 23, 1989, Ser. No. 397,672

Claims priority, application Japan, Aug. 26, 1988, 63-211677; Aug. 29, 1988, 63-214068

Int. Cl.[5] B05D *5/00, 1/26;* B05C *3/18*

U.S. Cl. 427—287 16 Claims



1. A method of coating a thin liquid film on a surface of a substrate over a predetermined area of the surface, comprising the steps of:

(a) bringing the substrate and an incomplete tank, which has an opening of a shape similar to the shape of said surface of the substrate on one side thereof, into tight contact with each other such that said opening is closed by said surface of the substrate thereby completing the tank;

(b) introducing a coating liquid into said tank until the liquid level in the tank reaches a predetermined level which corresponds to the upper boundary of said area of the substrate surface; and

(c) while keeping both said tank and the substrate stationary, extracting the coating liquid from said tank through a flow streamlining channel so as to lower the liquid level in the tank at a predetermined rate without producing a turbulent flow of the coating liquid to thereby leave a film of the coating liquid on said surface of the substrate, said streamlining channel communicating with a lower section of said tank by an aperture in a wall of said tank and extending downward from the level of said aperture.

8. An apparatus for coating a thin liquid film on a surface of a substrate over a predetermined area of the surface, the apparatus comprising:

means for holding the substrate;

an incomplete liquid tank having an opening of a shape similar to the shape of said surface of the substrate on one side thereof;

means for defining a flow streamlining channel which communicates with said tank by an aperture formed in a lower section of said tank and extends downward from the level of said aperture;

means for bringing the substrate and said incomplete tank into tight contact with each other such that said opening of said tank is closed by the substrate thereby completing the tank and keeping the tank and the substrate stationary in the tightly contacting state;

means for introducing a coating liquid into said tank kept stationary and in contact with the substrate; and

means for extracting the coating liquid from said tank kept stationary and in contact with the substrate at a predetermined rate through said streamlining channel without producing a turbulent flow of the coating liquid to thereby leave a film of the coating liquid on the substrate surface.

5,009,934

PROCESS FOR PREPARING POLY-(IMIDESILOXANES)

Guido Wenski, Munich; Ludwig Maier, Eggenfelden, and Franz-Heinrich Kreuzer, Martinsried, all of Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Filed Jul. 6, 1990, Ser. No. 549,586

Claims priority, application Fed. Rep. of Germany, Jul. 28, 1989, 3925099

Int. Cl.[5] B05D *3/02*

U.S. Cl. 427—387 13 Claims

1. A process for preparing poly-(imidesiloxanes) which comprises reacting an N,N'-dialkenyldiimide with an organosilicon compound containing two Si-bonded hydrogen atoms in the presence of a catalyst which promotes the addition of Si-bonded hydrogen to an aliphatic multiple bond.

5,009,935

PROTECTING METALLIC LAYERS ON SUBSTRATES

Keith J. Waddington, Essex, and Peter W. Johnson, Chingford, both of England, assignors to MacPherson plc, Suffolk, England

Filed Sep. 12, 1989, Ser. No. 406,076

Claims priority, application United Kingdom, Sep. 14, 1988, 8821503

Int. Cl.[5] C23C *26/00*

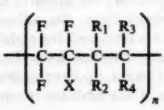
U.S. Cl. 428—457 10 Claims

1. A method of producing an article comprising applying a non-ferrous metal layer on a substrate and protecting the metal layer by applying thereto a compound having a nitrogen atom which is linked to the remainder of the compound by three single bonds and which has an accessible electron lone pair, such that the electron lone pair bonds to the metal to form a complex which is insoluble or substantially insoluble in water and which protects the metal layer.

10. An article made according to the method of claim 1.

5,009,936
METHOD FOR FORMING TRANSPARENT MULTILAYERS
Masahiko Yamanaka, Kanagawa; Motoyoshi Hansoka; Hiroaki Konse, both of Tokyo; Haruhisa Shigeno, Saitama, all of Japan, and Masakatsu Kinoshita, Rocky River, Ohio, assignors to Nissan Motor Co., Ltd., Kanagawa and Nippon Paint Co. Ltd., Osaka, both of, Japan
Filed Sep. 5, 1989, Ser. No. 402,718
Claims priority, application Japan, Sep. 2, 1988, 63-219668
Int. Cl.[5] B05D 1/36, 7/00
U.S. Cl. 427—407.1 8 Claims

1. A method for forming a transparent multilayer wherein first a transparent paint A comprising a film forming amount of an acrylic copolymer, wherein monomers incorporated to form the acrylic copolymer have an average molecular weight of from 5,000 to 30,000, a hydroxyl value per gram of solid content of from 30 to 100, and an acid value of from 5 to 20, and then a film forming amount of a transparent paint B, which is dissolved in organic solvent, of fluorine containing polymer comprising the formula



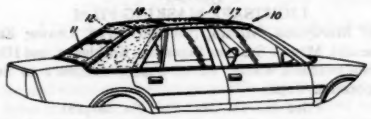
wherein X represents a fluorine or chlorine atom, and R_1, R_2, R_3, and R_4 each represents a hydrogen atom, hydroxyalkyl group, or carboxyalkyl group,

are applied on a conventional finish coating with a wet-on-wet process.

5,009,937
SAPSTAIN CONTROL COMPOSITION AND METHOD
Michael H. West, Senatobia, Miss., and Gregg Overman, Memphis, Tenn., assignors to Chapman Chemical Company, Memphis, Tenn.
Filed Sep. 7, 1989, Ser. No. 403,924
Int. Cl.[5] B05D 7/06
U.S. Cl. 427—440 6 Claims

1. A method for controlling sapstain and mold on wood having 20% or more of moisture which consists of contacting wood with an aqueous solution containing (a) at least 0.05% by weight of chlorothalonil and (b) borax in a quantity between 3 and 9 times greater than the weight of the chlorothalonil.

5,009,938
CUSTOMIZED AUTOMOBILE
Joseph T. Raj, Riverview, Mich., assignor to Evans Automotive, Division of Evans Industries, Inc., Wayne, Mich.
Filed Feb. 5, 1990, Ser. No. 475,356
Int. Cl.[5] B62D 25/06
U.S. Cl. 428—31 4 Claims



1. For use in customizing an automobile having a front window, a rear window and a top,

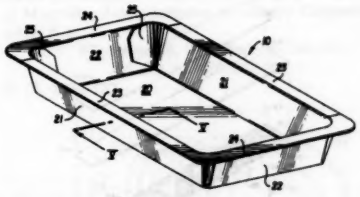
a plastic cap including a rear window portion and a top portion adapted to overlie the rear window portion and the top of the automobile respectively,

at least one separate section adapted to be provided in partially overlapping relation to the top portion of the cap, said plastic cap and said at least one separate section having forward and rearward transverse free edges,

said rearward transverse free edge of said at least one separate section being in overlying relation to said forward transverse free edge of said plastic cap, and

wherein said at least one separate section extends in a longitudinal direction away from said read window toward said front window increasing the length of said top portion to further cover said top.

5,009,939
COMPOSITE PAPERBOARD AND POLYMER PACKAGE
Barry A. Goldberg, Highland Park, Ill., assignor to Westvaco Corporation, New York, N.Y.
Filed Sep. 22, 1989, Ser. No. 411,038
Int. Cl.[5] B65D 5/56
U.S. Cl. 428—34.2 12 Claims



1. A blow molded composite material fluid container comprising a paperboard exterior substrate having a thickness of 0.007 to 0.035 inches formed to a fluid containment configuration having an interior vessel surface area, said formed paperboard substrate having a seamless, creaseless and unlapped fluid barrier coating of blow molded polymer integrally bonded to substantially the entire vessel surface area thereof, said barrier coating having an average thickness about half of said paperboard thickness.

5,009,940
CUP FOR DYEING EGGS
James E. McShane, Memphis, Tenn., assignor to Plough, Inc., Memphis, Tenn.
Division of Ser. No. 97,038, Sep. 16, 1987, Pat. No. 4,853,240. This application May 24, 1989, Ser. No. 356,811
Int. Cl.[5] B65D 25/14; A23L 1/275
U.S. Cl. 428—35.7 7 Claims

1. A cup having formed on the inside surface thereof a water-soluble dyeing composition comprising a water-soluble dye carrier, a water-soluble dye and a water-soluble dye plasticizer in the ratio of about 10–20 parts by weight of said carrier to about 4–15 parts by weight of water-soluble dye to about 0.5–7 parts by weight of said plasticizer.

5,009,941
TUBE OR PIPE FORMED A THERMOPLASTIC POWDER IMPREGNATED FIBERGLASS ROVING
Jean-Claude Pollet, Granville; Gary L. Williams; Gordon P. Armstrong, both of Newark, and David G. Miller, Pataskala, all of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio
Continuation of Ser. No. 24,949, Mar. 12, 1987, abandoned. This application Nov. 9, 1988, Ser. No. 269,029
Int. Cl.[5] B32B 1/08; B29D 22/00
U.S. Cl. 428—36.3 4 Claims

1. A pipe or tube formed from a yarn or strand consisting essentially of a plurality of glass filaments, at least a portion of the filaments' surfaces coated with a coating formed from the residue produced by evaporating water from an aqueous composition for the glass filaments comprising, in weight percent, an organosilane coupling agent in the range of about 0.05 to

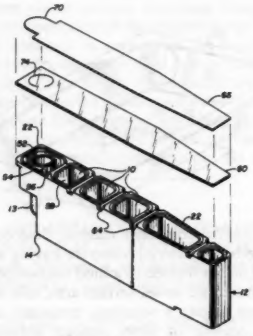
about 5.0%, by weight, a polyethylene oxide binder or film former material in the range of about 0.5 to about 5.0%, by weight, and a polypropylene thermoplastic polymer resin powder in the range of about 30–50%, by weight, and having an average particle size between about 5 to about 50 microns, the balance being water.

5,009,942

VORTEXING LIQUID CONTAINER

Joshua Benin, Newark, Del.; William G. Di Maio, Brookhaven, Pa.; Carl F. Morin, Brandywood, Del., and James A. Lawler, Rio Piedras, P.R., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 26, 1988, Ser. No. 237,589
Int. Cl.[5] B01C *3/00*
U.S. Cl. 428—36.6 9 Claims



1. A housing encasing an elongated vessel, said vessel having a bottom, a side wall and a longitudinal axis, the vessel being plastic and having a peripheral mounting surface, the housing comprising:

a flexible, fingerlike hinge connecting the housing to a side wall of the vessel and integral with both the housing and vessel, whereby the vessel bottom is capable of nutational movement about the axis, and

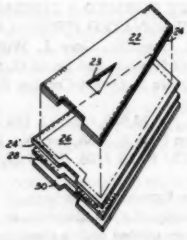
a laminate, providing a gas and vapor seal, connected to the mounting surface.

5,009,943

PRE-SEWN LETTER AND METHOD

Ted Stahl, Mt. Clemens, Mich., assignor to Stahls' Inc., St. Clair Shores, Mich.

PCT No. PCT/US88/03700, § 371 Date Jan. 18, 1990, § 102(e) Date Jan. 18, 1990
PCT Filed Oct. 21, 1988, Ser. No. 459,727
Int. Cl.[5] B32B *31/00*
U.S. Cl. 428—40 8 Claims



1. A method for producing a laminated embroidered emblem which may be bonded to a fabric comprising the steps of providing a first woven material blank, providing a barrier layer of a thermoplastic material, laminating with the application of heat and pressure the barrier layer onto one side of the first material blank, cutting the material blank with barrier layer to the configuration of the emblem to be produced, sewing a thread about the periphery of the cut first material blank and barrier layer to produce an embroidered appearance, providing a second woven material blank having a different color than the first material blank, providing a similar barrier layer of a thermoplastic material, laminating with the application of heat and pressure the barrier layer onto one side of the second material blank, cutting the second material blank and barrier layer to a configuration complimentary with the cut first material blank, yet larger in proportion to supply a background, sewing a thread about the periphery of the cut second material blank to produce an embroidered appearance, positioning the cut first material blank over the second material blank and heat sealing both cut material blanks together to form a two color fabric laminate having a foreground and background color, and applying an adhesive layer of an uncured linear saturated polyester in combination with a heat activated curing agent, having a paper carrier, to the exposed barrier layer, the adhesive layer having a lower melting temperature than the exposed barrier layer whereby the adhesive layer being unable to pass through the barrier layer, the adhesive layer allowing, after the paper carrier is removed, the emblem to be heat sealed to difficult to adhere to materials from the group consisting of siliconized nylon, Gortex, polypropylene, tri-acetate and Lycra yet appear as if the emblem is embroidered onto the material.

8. A laminated embroidered emblem for bonding to a fabric comprising:

a first woven material layer of preselected design;

a first barrier layer of a thermoplastic material overlying one face of the first woven material layer;

embroidery stitching about the periphery of the first woven material layer and extending through the first barrier layer;

a second woven material layer larger than the first woven material layer and of a contrasting color and complementary shape;

a second barrier layer of a thermoplastic material overlying one but not the opposite face of the second woven material layer;

embroidery stitching about the periphery of the second woven material layer and extending through the second barrier layer;

said first and second woven material layers being heat sealed together with the first barrier layer fused to the opposite face of the second woven material layer opposite; and

an adhesive layer of an uncured linear saturated polyester in combination with a heat activated curing agent and having a lower melting temperature than the second barrier layer and lightly adhered to the second barrier layer on the second woven material layer and adapted for heat sealing and cross linking application to difficult-to-adhere-to materials from the group consisting of siliconized nylon, Gortex, polypropolene, tri-acetate and Lycra.

5,009,944

LIGHTSAFE MASKING FILM

Hiroshi Maruyama, Misato; Naohiko Kiryu, Urawa; Etsuko Minezaki, Misato; Susumu Tagashira, Koshigaya, and Hisashi Shimokawahara, Chiba, all of Japan, assignors to Somar Corporation, Japan

Filed Jul. 18, 1989, Ser. No. 381,181
Claims priority, application Japan, Jul. 20, 1988, 63-182464; Jan. 31, 1989, 1-21911
Int. Cl.[5] B32B *7/06, 7/12*
U.S. Cl. 428—40 18 Claims

1. A lightsafe masking film, comprising a substrate, a pressure sensitive adhesive layer formed on said substrate, and a lightsafe, peelable layer formed on said adhesive layer and including a dialkyl phthalate, nitrocellulose, and a lightsafe

colorant, said dialkyl phthalate being 10–50% of the total weight of said dialkyl phthalate and said nitrocellulose.

5,009,945

TRANSPARENT FILM AND COLOR IMAGE FORMING METHOD

Tatsuo Takeuchi, Kawasaki, and Koji Amemiya, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 22, 1989, Ser. No. 369,851

Claims priority, application Japan, Jun. 29, 1988, 63-163107; Dec. 23, 1988, 63-326521; Jun. 15, 1989, 1-154193

Int. Cl.[5] B32B *3/02*

U.S. Cl. 428—76 **33 Claims**

1. A transparent laminate film adapted to receive a color toner image from a toner comprising at least a binder resin and a chromatic colorant and useful in an overhead projector, comprising: at least a first transparent resin layer comprising a heat-resistant first transparent resin, and a second transparent resin layer disposed thereon comprising a second transparent resin; said second transparent resin of the second transparent resin layer being compatible with said binder resin of said toner to be fixed thereon, and having a larger elasticity than that of the binder resin of the toner at a fixing temperature of the toner;

wherein (i) said first transparent resin of said first transparent resin layer has a heat distortion temperature of a minimum of 145° C.; and

(ii) said second transparent resin of said second transparent resin layer has a storage elasticity modulus of 100–10,000 dyne/cm^2 at 160° C.

5,009,946

COMPOSITE SHEET FOR AUTOMOTIVE USE

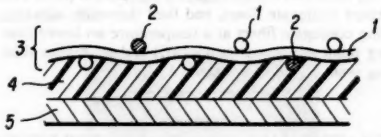
Isamu Hatomoto, Nishinomiya, and Yoshiteru Matsuo, Kurashiki, both of Japan, assignors to Kuraray Company Limited, Kurashiki and Honda Giken Kogyo Kabushiki Kaisha, Tokyo, both of, Japan

Continuation-in-part of Ser. No. 161,103, Feb. 26, 1988, abandoned. This application Dec. 15, 1989, Ser. No. 449,419

Claims priority, application Japan, Mar. 3, 1987, 62-49862

Int. Cl.[5] B32B *5/24, 5/30, 7/02, 33/00*

U.S. Cl. 428—87 **3 Claims**



1. A composite automotive upholstery sheet having antistatic and static-eliminating properties which comprises a textile layer containing an electrically conductive fiber with an electric resistance of 10^5 to 10^9 ohms/cm and a backing semiconductive layer with a surface resistivity of 10^7 to 10^{10} ohms integral and in contact with said textile layer;

said textile layer being:

a woven or knitted fabric originally having substantially no vertical hair on the surface thereof, comprising as part of its constituting yarns a chenille yarn containing said conductive fiber as at least part of the effect yarn of said chenille yarn, said chenille yarn being present on said fabric at spaced intervals not exceeding 30 mm; or

a woven or knitted fabric having vertical hair, comprising said conductive fiber as groups of 4 to 18 pieces of vertical conductive filaments distributed on the fabric surface in spots, at least one such spot being present in any hypothetical circular area having a diameter of 30 mm drawn on the fabric surface; and

said conductive fiber being a sheath-core composite fiber comprising as the core component a resin composition which comprises a resin and a conductive powder comprising titanium dioxide particles coated on the surface thereof with a conductive metal oxide and as the sheath component a polyester.

5,009,947

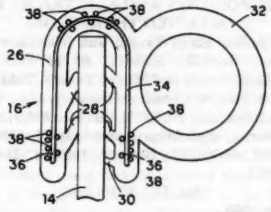
ELASTOMERIC STRIP AND METHOD OF MANUFACTURE

Michael J. McManus; David H. Berry, and Harold P. Dover, all of Maryville, Tenn., assignors to Schlegel Corporation, Rochester, N.Y.

Filed Apr. 28, 1989, Ser. No. 345,612

Int. Cl.[5] E06B *7/16*

U.S. Cl. 428—122 **5 Claims**



1. An elastomeric strip of substantially U-shaped cross section of a finite length and a finite width for mounting on a flange having longitudinally-spaced curved sections, comprising:

a support frame having longitudinally displaceable frame portions;

longitudinally extending degradable reinforcing materials secured to the frame portions for reinforcing the frame portions to inhibit longitudinal displacement of the frame portions during the coating operation;

a coating of elastomeric material on at least one surface of a reinforced support frame; and

a plurality of longitudinally-spaced degraded regions of the degradable reinforcing material of the strip in which all of the reinforcing material is degraded, such that the degraded regions of the strip are substantially unrestricted longitudinally by the reinforcing material and correspond to the longitudinally-spaced curve sections of the flange, whereby the degraded regions more faithfully follow the curved sections of the flange when the elastomeric strip is mounted thereon.

5,009,948

LOW GRAVITY ENHANCED GROWTH OF PHTHALOCYANINE POLYMORPH FILMS

Mark K. Debe, Stillwater, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

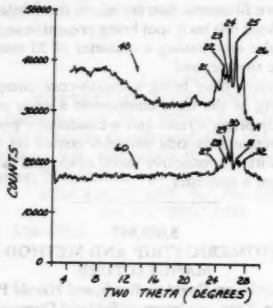
Continuation-in-part of Ser. No. 218,817, Jul. 13, 1988, abandoned. This application Mar. 23, 1989, Ser. No. 327,898

Int. Cl.[5] B32B *5/16, 9/00;* **B05D** *3/00*

U.S. Cl. 428—141 **11 Claims**

1. A film of a phthalocyanine comprising at least 50 weight percent of a single polymorph, said film having been prepared in a low gravity environment of at most 0.1 G which is free of buoyancy driven convection, said film having a surface rough-

ness factor in a range greater than 1.000000 and less than 1.000010 and a density at least 50 percent greater than any



polymorph of the same molecules produced in unit gravity, and in which at least 50 weight percent of the molecules of said film have a common uniaxial orientation.

5,009,949

RESIN COMPOSITION AND ELECTRICAL LAMINATE OBTAINED THEREFROM

Kazuyuki Tanaka; Etsuji Iwami; Jun Matsuzawa; Yoshiyuki Mukoyama; Norihiko Shibata, all of Hitachi; Akinori Hanawa, Shimotsuma, and Mitsuo Yokota, Yuki, all of Japan, assignors to Hitachi Chemical Company, Ltd., Tokyo, Japan

Filed May 17, 1988, Ser. No. 194,918

Claims priority, application Japan, May 21, 1987, 62-124950; Dec. 22, 1987, 62-324571; Dec. 29, 1987, 62-334220; Apr. 1, 1988, 63-82072

Int. Cl.[5] B32B *7/00*

U.S. Cl. 428—260 **12 Claims**

1. A laminate for electrical use obtained by impregnating one or more substrates with a resin composition comprising

(A) 80 to 20 parts by weight of a copolymer having carbon-carbon unsaturated bonds in its side chains and obtained by reacting (i) a copolymer obtained by copolymerizing 0 to 50% by mole of an alkyl acrylate or alkyl methacrylate, 10 to 50% by mole of a hydroxyalkyl acrylate or a hydroxyalkyl methacrylate, and 0 to 90% by mole of an ethylenically unsaturated monomer, a total being 100% by mole, with (ii) an unsaturated carboxylic acid or an anhydride thereof, and

(B) 20 to 80 parts by weight of a monomer copolymerizable with (A), a total of (A) and (B) being 100 parts by weight, and

curing the resin impregnated substrates.

5,009,950

COMPOSITE STRUCTURES

Joachim Wagner, Cologne; Karl Peltzer, Leichlingen, and Werner Rasshofer, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Bayerwerk, Fed. Rep. of Germany

Filed Mar. 14, 1989, Ser. No. 323,454

Claims priority, application Fed. Rep. of Germany, Mar. 22, 1988, 3809524

Int. Cl.[5] C08G *18/00*; B32B *5/02, 5/26, 5/28*

U.S. Cl. 428—290 **8 Claims**

1. A composite structure comprising at least two different flat, thermoplastically formable plastic materials which is prepared by a process which comprises placing said materials in layers one above the other and thermoplastically molding said materials under sufficient conditions of temperature and pressure that molding is accompanied by intimate union of individual layers of the structure, wherein at least one of said materials is based on a polyisocyanate polyaddition product containing at least one group selected from the group consisting of urea and urethane groups, having a density of at least 0.8 g/cm^3 and prepared by reacting at an isocyanate index of about 60 to 140

(a) an aromatic polyisocyanate with

(b) a compound having a molecular weight of about 1800 to 12,000 and containing an average of at least 2.5 isocyanate reactive groups and

(c) at least 5% by weight, based on the weight of component (b), of a member selected from the group consisting of diamines having a molecular weight of 108 to 400 and containing two primary aromatically bound amino groups, diamines having a molecular weight of 108 to 400 and containing two secondary aromatically bound amino groups, diamines having a molecular weight of 108 to 400 and containing one primary aromatically bound amino group and one secondary aromatically bound amino group,

aliphatic polyols having a molecular weight of 60 to 1799, cycloaliphatic polyols having a molecular weight of 60 to 1799, aliphatic polyamines having a molecular weight of 60 to 1799 and cycloaliphatic polyamines having a molecular weight of 60 to 1799.

5,009,951

CONJUGATE FIBERS AND NONWOVEN MOLDING THEREOF

Tadayuki Ohmae; Tadashi Sakurai, and Kouichiro Asao, all of Chiba, Japan, assignors to Sumitomo Chemical Co., Ltd., Osaka, Japan

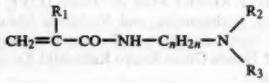
Division of Ser. No. 189,439, May 2, 1988, Pat. No. 4,840,847. This application Apr. 13, 1989, Ser. No. 337,602

Claims priority, application Japan, Feb. 4, 1988, 63-25466

Int. Cl.[5] B32B *27/02, 27/32*; D02G *3/02*

U.S. Cl. 428—294 **4 Claims**

1. A nonwoven molding obtained by melt spinning (A) a crystalline poly-α-olefin and (B) an ethylene copolymer containing from 40 to 95% by weight of an ethylene unit and from 5 to 60% by weight of at least one dialkylaminoalkylacrylamide comonomer unit represented by formula (I):



(I)

wherein R_1 represents a hydrogen atom or methyl group; R_2 and R_3 each represents an alkyl group having from 1 to 4 carbon atoms; and n represents an integer of from 2 to 5, said ethylene copolymer having a melt index of from 10 to 1000 g/10 min as measured according to JIS K-6760, either by aligning the components (A) and (B) in parallel or by aligning the component (A) as a core and the component (B) as a sheath to prepare conjugate fibers, and then thermally adhering the resulting conjugate fibers at a temperature no lower than the melting point of the component (B) and no higher than the melting point of the component (A).

5,009,952

INSULATING WALL FOR REFRIGERATOR DEVICES

Wilhelm Klepsch, and Dietmar Plöbst, both of Kaprun, Austria, assignors to Senoplast Klepsch & Co., Kaprun, Austria

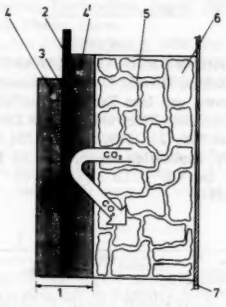
Filed Aug. 23, 1990, Ser. No. 572,056

Int. Cl.[5] F25D *23/08*; B32B *5/20, 7/04*

U.S. Cl. 428—319.1 **2 Claims**

1. An insulating wall for refrigerator devices, wherein a polyurethane is foamed between an exterior metal sheet and a deep-drawn plastics material plate selected from a member of the group of polystyrole or acrylonitrile-butadiene-styrene, characterized in that the cell-gas of the polyurethane foam is carbon dioxoide and that the plastics material plate comprises

in its interior a blocking layer of 0.03–0.6 mm thickness formed of a copolymer of polyethylene and vinyl alcohol where the



molar percent of polyethylene in the copolymer is in the range of 32–44.

5,009,953

NON-DUSTING WINDOW ENVELOPE FILM UTILIZING A PARTICULATE ANTI-FLECKING AGENT

Stephen I. Foster, Bexley; Jeffrey J. Stimler, Newark, and Gail S. Nonnemacher, Reynoldsburg, all of Ohio, assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 220,296, Jul. 18, 1988, abandoned, and Ser. No. 393,057, Aug. 10, 1989, abandoned. This application Oct. 17, 1989, Ser. No. 422,846

Int. Cl.[5] B32B *5/16;* B29C *51/02*

U.S. Cl. 428—327 25 Claims

1. A window envelope having a non-opaque plastic window patch formed of a film comprising polystyrene and from about 0.1 to about 3.0 percent by weight of one or more particulate anti-flecking agents having from about a 0.1 to about 10.0 micron number average particle size, the one or more particulate anti-flecking agents each having a melting point greater than the polystyrene of the window envelope film and being substantially non-compatibilized and chemically inert with and substantially insoluble in the window envelope film.

5,009,954

SHEATH CORE FIBER AND ITS METHOD OF MANUFACTURE

John R. Collier, and Billie J. Collier, both of Athens, Ohio, assignors to Ohio University, Athens, Ohio

Continuation of Ser. No. 161,293, Feb. 29, 1988, abandoned, which is a continuation-in-part of Ser. No. 754,327, Jul. 12, 1985, abandoned. This application Apr. 4, 1990, Ser. No. 506,495

Int. Cl.[5] D02G *3/00*

U.S. Cl. 428—400 5 Claims

1. A sheath core fiber comprising an inner continuous core of an oriented thermoplastic material completely surrounded by a continuous adherent organic polymeric sheath which is formed from a polymer sheath forming material in liquid form, is not readily removable from said core, is retained on said core during ultimate usage of said fiber, and is made of a nonthermoplastic material, said sheath having minimal orientation and characterized by microscopic surface dimpling resulting in an enhanced surface area for higher sorptivity and greater dyeability.

5,009,955

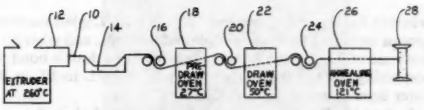
DUAL MODULUS ORIENTED ELASTOMERIC FILAMENTS

Ismat A. Abu-Isa, Rochester Hills, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 6, 1989, Ser. No. 318,998

Int. Cl.[5] D02G *3/00*

U.S. Cl. 428—401 2 Claims



1. An oriented elastomeric filament spun from a thermoplastic elastomeric material selected from the group consisting of a block copolymer of polybutylene terephthalate and polytetramethylene glycol, a block copolymer of polybutylene terephthalate/polybutylene isophthalate and polyethylene glycol/-polypropylene glycol, a block copolymer of polybutylene terephthalate/polyhexene terephthalate and polytetramethylene glycol, and a block copolymer of polyurethane and polytetramethylene glycol, the mole fraction of said polybutylene terephthalate, polybutylene terephthalate/polybutylene isophthalate and polybutylene terephthalate/polyhexane terephthalate in said block copolymers being less than 0.5, said elastomeric filament being further oriented after said spinning by stretching at temperatures between 20° C. to 120° C. to a draw ratio between 500 percent to 700 percent elongation such that said oriented filament having a diameter between 0.33 to 0.51 millimeters and exhibits an ultimate strain no larger than 140 percent when tested in accordance with ASTM D-638 tensile test.

5,009,956

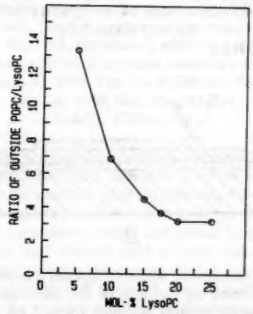
PHOSPHOLIPASE A_2-RESISTANT LIPOSOMES

Wolfgang J. Baumann, Austin, Minn., assignor to Regents of the University of Minnesota, Minneapolis, Minn.

Continuation of Ser. No. 17,369, Feb. 24, 1987, abandoned. This application Mar. 31, 1989, Ser. No. 333,829

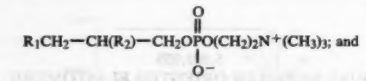
Int. Cl.[5] A61K *9/133, 37/22;* B01J *131/04*

U.S. Cl. 428—402.2 11 Claims



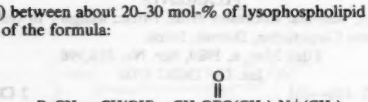
1. A method of stabilizing a liposome membrane comprising forming a unilamellar liposome having a single bilayer membrane having an outer layer and an inner layer including:

(a) between about 70–80 mol-% of a phospholipid (PL) of the formula:



$$R_1CH_2-CH(R_2)-CH_2OPO(CH_2)_2N^+(CH_3)_3;\ \text{and}$$

(b) between about 20–30 mol-% of lysophospholipid (LPL) of the formula:



$$R_3CH_2-CH(OH)-CH_2OPO(CH_2)_2N^+(CH_3)_3$$

wherein R_1, R_2, and R_3 are individually (C_{10}–C_{30})alkanoyloxy groups including from about 0–4 double bonds, and wherein at least one of R_1, R_2, and R_3 include at least one double bond; by combining (a) and (b) so that the ratio of LPL to PL in the outer layer is about 0.275–0.35:1.0.

5. A stable liposome made by the process of claim 1.

5,009,957

MICROENCAPSULATED PLATINUM-GROUP METALS AND COMPOUNDS THEREOF

Chi-Long Lee, and Robin L. Willis, Jr., both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Division of Ser. No. 75,789, Jul. 20, 1987, Pat. No. 4,874,667. This application Mar. 23, 1989, Ser. No. 327,652

Int. Cl.[5] B32B *27/00, 9/04, 25/00*

U.S. Cl. 428—402.22 **8 Claims**

1. A microencapsulated platinum-group metal or a compound thereof, in the form of a free flowing powder consisting essentially of microcapsules that, in turn, comprise said metal or compound as finely divided particles or droplets that are completely enveloped within one or an inner layer and an outer layer formed from thermoplastic organic polymers, the average diameter of said microcapsules is less than 500 microns, said thermoplastic organic polymers constitute at least 50 percent of the weight of said microcapsules, and said catalyst composition comprises a metal from the platinum group of the periodic table or a compound thereof.

5,009,958

FUNCTIONAL DEVICES COMPRISING A CHARGE TRANSFER COMPLEX LAYER

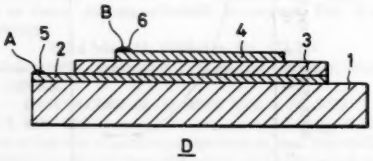
Akio Yamashita, Kanagawa; Susumu Yoshimura, Yokohama, and Sohji Tsuchiya, Kanagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Mar. 4, 1988, Ser. No. 170,025

Claims priority, application Japan, Mar. 6, 1987, 62-52537; Mar. 6, 1987, 62-52538; May 14, 1987, 62-117353

Int. Cl.[5] B32B *9/04*

U.S. Cl. 428—411.1 **12 Claims**



D

1. A functional device which comprises a substrate, an electrode layer formed on one side of the substrate, at least one layer of a charge transfer complex formed on the electrode layer and capable of undergoing a neutral-ionic phase transition and a variation in charge transferability by application of external energy, and another electrode layer formed on the complex layer, said charge transfer complex consisting essentially of an electron donor and an electron acceptor, at least one of which is an organic compound with a long-chain alkyl substituent having from 10 to 22 carbon atoms.

5,009,959

FLUORINE RESIN COATED ARTICLE

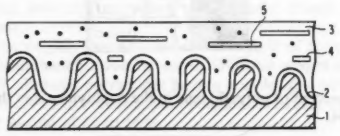
Nobutaka Matsushita; Hiroshi Okazaki; Shosuke Yamanouchi; Yoshitaka Osawa, and Isao Tsujigaito, all of Osaka, Japan, assignors to Sumitomo Electric Industries Ltd., Osaka, Japan

Filed May 22, 1989, Ser. No. 354,563

Claims priority, application Japan, May 20, 1988, 63-124466

Int. Cl.[5] B32B *17/06, 15/08*

U.S. Cl. 428—419 **10 Claims**



1. A fluorine resin coated article comprising a metal substrate coated with a composition comprising a fluorine resing containing (a) a polyamideimide resin, a polyimide resin, a polyphenylene sulfide resin, a polyethersulfone resin or a mixture thereof in an amount of from 0.5 to 10 wt % based on the amount of said fluorine resin, and mica in an amount of from 0.5 to 10 wt % based on the amount of said fluorine resin.

5,009,960

MAGNETIC RECORDING MEDIUM PREPARED WITH POLYURETHANE RESIN MODIFIED BY A BICYCLIC AMIDE ACETAL

Takeshi Yatsuka; Hiroshi Murata; Yutaka Mizumura, and Nobukazu Kotera, all of Ohtsu, Japan, assignors to Ashland Oil, Inc., Russell, Ky.

Filed Nov. 6, 1989, Ser. No. 432,555

Claims priority, application Japan, Nov. 8, 1988, 63-282269

Int. Cl.[5] G11B *23/00*

U.S. Cl. 428—423.1 **4 Claims**

1. A magnetic recording medium comprising a non-magnetic support and a magnetic coating layer formed thereon, said magnetic coating layer being formed by applying a magnetic coating composition comprising a resinous binder and magnetic particles dispersed therein, wherein said coating composition contains, as a resinous binder, a modified polyurethane resin obtained by reacting a polyurethane resin (A) with a bicyclic amide acetal (B), said polyurethane resin (A) having carboxyl groups in an amount of 50 to 2,000 equivalents 10^6 g and the equivalent ratio of said bicyclic amide acetal (B) to the carboxyl groups of the polyurethane resin (A) being within the range of 0.5 to 2.0.

5,009,961

PRECERAMIC COMPOSITIONS AND CERAMIC PRODUCTS

Leonard M. Niebylski, Birmingham, Mich., assignor to Ethyl Corporation, Richmond, Va.

Filed Jun. 30, 1989, Ser. No. 374,063

Int. Cl.[5] B32B *9/04*

U.S. Cl. 428—446 **13 Claims**

1. A dispersion of about 0.25–2.0 parts by weight of silicon metal, about 0.25–2.0 parts weight of silicon tetraboride, about 0.25–2.0 parts by weight of silicon hexaboride, and about 0.2 parts by weight of silicon carbide in the product obtained by intimately dispersing about 0.1–1.0 part by weight of a Group IVA compound selected from salts and organometallic compounds of Group IVA metals in an organic solvent solution containing one part by weight of a polysilazane.

5,009,962

SURFACE TREATMENT CHEMICAL AND BATH FOR FORMING HYDROPHILIC COATINGS AND METHOD OF SURFACE-TREATING ALUMINUM MEMBERS

Katsuyoshi Yamasoe, Yotsukaidou, Japan, assignor to Nippon Paint Co., Ltd., Osaka, Japan

Division of Ser. No. 293,290, Jan. 4, 1989, Pat. No. 4,973,359.
This application Jun. 15, 1990, Ser. No. 538,807
Int. Cl.[5] B32B *15/04*; C23C *22/00*
U.S. Cl. 428—470 4 Claims

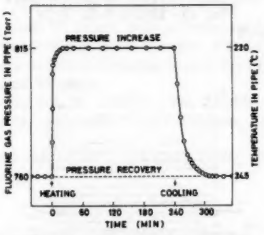
1. An aluminum member provided with a hydrophilic coating comprising, on a solid basis, 5–25 parts by weight of a sodium salt and/or a potassium salt of a carboxymethylcellulose, 25–50 parts by weight of an ammonium salt of carboxymethylcellulose, and 25–70 parts by weight of N-methylol acrylamide.

5,009,963

METAL MATERIAL WITH FILM PASSIVATED BY FLUORINATION AND APPARATUS COMPOSED OF THE METAL MATERIAL

Tadahiro Ohmi, 2-1-17-302, Komegafukuro, Sendai-shi, Miyagiken; Masahiro Miki, 23-14-521, Tezukayama 1-Chome, Abeno-ku, Osaka; Hirohisa Kikuyama, 7-13, 3-Cho, Ayameike Kita, Nara-shi, Nara-ken, and Matagoro Maeno, 2-42-6, Komyodai, Izumi-shi, Osaka, all of Japan

Filed Jul. 19, 1989, Ser. No. 381,914
Claims priority, application Japan, Jul. 20, 1988, 63-181225; Jan. 13, 1989, 1-6892
Int. Cl.[5] C23F *20/06*
U.S. Cl. 428—472.2 6 Claims



1. A metal material comprising a metal substrate, and a passivated film formed on at least a portion of the surface of the metal substrate by fluorination of the metal substrate, said film being composed mainly of a metal fluoride in which the proportion of metal to fluorine is substantially in stoichiometric relationship, wherein said metal substrate is baked prior to fluorination in an inert atmosphere and said fluorinated metal substrate is heat-treated to form said stoichiometric relationship.

5,009,964

COMPOSITION AND PROCESS FOR IMPARTING FIRE RETARDANT PROPERTIES AND IMPROVED THERMAL STABILITY TO CELLULOSIC MATERIALS

Robert M. Leach, Grand Island, and Michael J. Richards, Williamsville, both of N.Y., assignors to Osmose Wood Preserving, Inc., Buffalo, N.Y.

Filed Jul. 11, 1989, Ser. No. 378,408
Int. Cl.[5] B32B *27/42*
U.S. Cl. 428—526 22 Claims

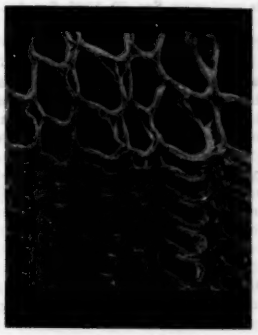
1. A process for forming a fire retardant composition useful for treating cellulosic materials to impart both fire retardant properties and improved thermal stability under high temperature and humidity conditions which comprises:

(a) reacting a solution of water, an oxy acid of phosphorus and a nitrogen containing compound selected from the group consisting of urea, melamine, mono, di and trimethylamine, mono, di, and triethylamine, dicyandiamide, hexamethylenetetramine and other equivalent nitrogen containing compounds in a weight ratio of about 0.1 to about 15 oxy acid per part nitrogen compound for a time of about 15 minutes to about 3 hours at a temperature from about 25° C. to about 90° C.;

(b) adjusting the pH of said solution from about 6.0 to about 9.0 with a water soluble alkaline compound selected from the group consisting of ammonia, ammonium hydroxide, mono, di and trimethylamine, mono, di and triethylamine and ethanolamine or other equivalent nitrogen containing alkaline compounds;

(c) reacting said solution with an aldehyde compound selected from the group consisting of formaldehyde, acetaldehyde, and glyoxal in a weight ratio of about 1.0 to about 56 total initial oxy acid per part aldehyde compound for a time of about 5 minutes to about 1.5 hours at a temperature from about 25° C. to about 90° C.; and

(d) adjusting the final pH of said solution from about 7.0 to about 8.5 with a water soluble alkaline compound selected from the group consisting of ammonia, ammonium hydroxide, mono, di and trimethylamine, mono, di and triethylamine and ethanolamine or other equivalent nitrogen containing alkaline compounds.



20. A cellulosic material impregnated with a fire retardant amount of the fire retardant composition made in accordance with the process of claim 1.

5,009,965

COLLOIDAL COMPOSITIONS FOR ELECTROLESS DEPOSITION

Nathan Feldstein, 63 Hemlock Clr., Princeton, N.J. 08540

Continuation of Ser. No. 171,333, Mar. 21, 1988, abandoned, which is a continuation of Ser. No. 948,089, Dec. 31, 1986, abandoned, which is a continuation of Ser. No. 878,865, Jun. 26, 1986, abandoned, which is a continuation-in-part of Ser. No. 264,214, May 15, 1981, abandoned, which is a division of Ser. No. 137,447, Apr. 4, 1980, abandoned, which is a division of Ser. No. 938,890, Aug. 31, 1978, Pat. No. 4,265,942. This application Sep. 26, 1988, Ser. No. 251,024
Int. Cl.[5] C23C *3/02*
U.S. Cl. 428—546 2 Claims

1. A colloidal composition useful in the metallization of an electrically non-conductive substrate wherein said colloidal composition is the reaction product resulting from the admixture in a liquid medium comprising at least one primary metal and at least one secondary metal, said metals being in positive oxidation states, and wherein said primary metal is selected from the group consisting of copper, nickel, iron, and cobalt and mixtures thereof and wherein said secondary metal is selected from the group consisting of aluminum, gallium, indium, germanium, lead, antimony, bismuth, chromium, tin, thallium, and mixtures thereof, and further wherein said primary metal and said secondary metal in said resultant colloidal

composition are in a reduced oxidation state derived through the chemical reduction in the admixture of both the primary and secondary metals both metals having been initially introduced in a higher oxidation state than their oxidation states in the resultant colloidal composition.

5,009,966

HARD OUTER COATINGS DEPOSITED ON TITANIUM OR TITANIUM ALLOYS

Diwakar Garg, 2815 Whitemarsh Pl., Macungie, Pa. 18062; Carl F. Mueller, 1221 Tatamy Rd., Easton, Pa. 18042; Leslie E. Schaffer, 244 W. Chestnut St., Macungie, Pa. 18062, and Paul N. Dyer, 3920 Pleasant Ave., Allentown, Pa. 18103

Division of Ser. No. 139,891, Dec. 31, 1987, Pat. No. 4,902,535. This application Sep. 19, 1989, Ser. No. 409,541

Int. Cl.[5] B32B *15/04*

U.S. Cl. 428—627 **14 Claims**

1. A coated substrate product comprised of

(1) a substrate selected from the group consisting of titanium and titanium alloy, which substrate has been treated with a mild abrasive to remove oxides from its surface,

(2) a thin, non-reactive noble metal interlayer deposited by an electroless plating technique after the treatment with said mild abrasive, said noble metal coated substrate is then subjected to a heat treatment by heating the substrate and the noble metal interlayer to a temperature in the range of about 200° to about 300° C. in the presence of air or a temperature in the range of about 200° to about 475° C. in the presence of an inert gas selected from the group consisting of argon, helium and mixtures thereof, and

(3) a hard outer coating selected from the group consisting of a ceramic, a hard metal, a hard metal compound and a carbon having a hardness of greater than 1,000 Vickers.

5,009,967

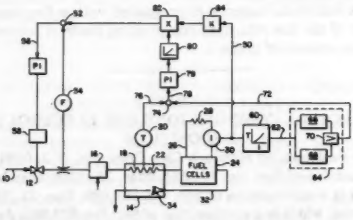
FUEL CELL POWER PLANT FUEL CONTROL

Glenn W. Scheffler, Tolland, Conn., assignor to International Fuel Cells Corporation, South Windsor, Conn.

Filed Oct. 24, 1989, Ser. No. 427,223

Int. Cl.[5] H01M *8/04*

U.S. Cl. 429—23 **4 Claims**



1. In a fuel cell power plant having, fuel supply means for supplying a flow of fuel, a reformer receiving and reforming said flow of fuel, a fuel stack receiving fuel from said reformer, a conduit for conveying fuel cell exhaust containing excess hydrogen to said reformer, a burner for burning said exhaust and said reformer in heat exchange relationship with the fuel supply passing through said reformer; a control system comprising:

a current sensor for sensing the electrical load on said fuel cell stack and establishing a current sensed signal;

a fuel flow summation point;

means for conducting said current sensed signal to said fuel flow summation point as a nominal desired fuel flow signal;

a temperature sensor for sensing the temperature of the reformed fuel at said reformer and establishing a temperature sensed signal;

a first function generator for setting a nominal desired reformer fuel temperature set point representing the steady state desired temperature as a function of the sensed current;

a dynamic compensator for modifying said desired reformer fuel temperature set point to obtain a transient temperature set point comprising, a first lead/lag compensator, a second lead/lag, compensator, one of said lead/lag compensators generating a predominantly lead characteristic signal and the other generating a predominantly lag characteristic signal, and a high select component for selecting and passing the higher signal of said lead characteristic signal and said lag characteristic signal;

error means for comparing said higher signal with said sensed temperature signal and establishing a temperature error signal;

means for modifying said nominal desired fuel flow signal as a function of by said temperature error signal and establishing a transient desired fuel flow set point signal to said fuel flow summation point;

fuel flow sensing means for establishing a fuel flow sensed signal;

means for conveying said fuel flow sensed signal to said fuel flow summation point and establishing a fuel flow error signal; and

fuel flow control means responsive to said fuel flow error signal for controlling said fuel flow.

5,009,968

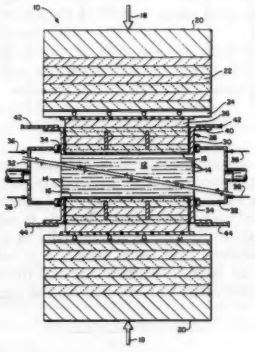
FUEL CELL END PLATE STRUCTURE

Robin J. Guthrie, East Hartford; Murray Katz, Newington, and Craig R. Schroll, Glastonbury, all of Conn., assignors to International Fuel Cells Corporation, South Windsor, Conn.

Filed Sep. 8, 1989, Ser. No. 405,251

Int. Cl.[5] H01M *8/02, 8/24*

U.S. Cl. 429—26 **14 Claims**



1. A fuel cell assembly comprising:

a fuel cell stack formed of a large number of fuel cells having electrodes and stacked in electrical series relationship;

an electrically conducting flexible membrane at each end of said stack, each membrane in electrical contact with an electrode at multiple spaced locations in a plane parallel to the planes of said fuel cells;

a pressure pad at each end of said fuel cell stack including a substantially planar surface in contact with the respective membrane;

compression means for exerting a compressive force on said pressure pads towards said fuel cell stack;

said membranes being sufficiently thin, that the compressive force maintains the membranes in intimate electrical contact with said electrodes at multiple locations;

each membrane integral with a box-like wall structure of a thickness greater than that of said membrane, and extend-

ing axially of said fuel cell stack at the outer periphery of said membrane; and

an electric power bus bar connected to said box-like wall structure.

5,009,969

DUAL ACTION SUNSCREEN COMPOSITION

Gary A. Miller, Monroe, N.Y., assignor to Hi-Tek Polymers, Inc., Jeffersontown, Ky.

Filed May 26, 1989, Ser. No. 357,985

Int. Cl.[5] A61K *7/40, 7/42, 7/44, 7/46*

U.S. Cl. 424—59 8 Claims

1. A dual action sunscreen composition comprising:

(A) about 0.2 to about 2 weight percent of hydroxypropyltrimethyl ammonium chloride guar having a DS of about 0.1 to about 0.2 and a viscosity of 1000–2000 cps as measured at 25° C. at 2 percent concentration in water,

(B) about 0.1 to about 2 weight percent of poly(methacrylamidopropyl trimethyl ammonium chloride) having a viscosity at 33 percent solids in water of about 2,000 to about 14,000 cps at 25° C.; and

(C) an ultraviolet absorbing sunscreen agent in the amount of about 0.1 to about 2 weight percent, wherein A, B and C are dispersed or dissolved in a cosmetically and dermatologically acceptable carrier which contains about 70 to about 85 weight percent water wherein said weight percents are based on the weight of the composition, wherein said composition when applied to the human skin provides sunburn protection and moisturizing effect.

5,009,970

POLYMER ELECTROLYTES

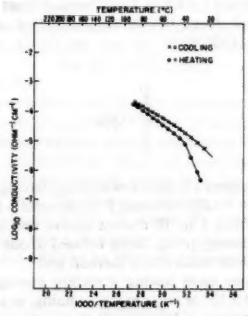
Esam Kronfli; Keith V. Lovell, both of Swindon; Alan Hooper, Faringdon, and Robin J. Neat, Marston, all of United Kingdom, assignors to United Kingdom Atomic Energy Authority, London, United Kingdom

Filed Jul. 25, 1988, Ser. No. 223,648

Claims priority, application United Kingdom, Jul. 28, 1987, 8717799

Int. Cl.[5] C08J *3/28;* C08K *3/24;* C08L *71/02;* H01M *6/18*

U.S. Cl. 429—192 2 Claims



1. A method of making a solid polymer electrolyte suitable for use as the electrolyte of a solid-state electrochemical cell, comprising the steps of irradiating with gamma radiation or an electron beam an aqueous solution of a polymer electrolyte comprising a complex of a polymer and an alkali metal salt, the polymer comprising poly(ethene oxide), which polymer is capable of forming donor-acceptor type bonds with alkali metal ions, the conditions of irradiation being such as to cause the said polymer itself to cross-link and to form a hydrogel thereby to inhibit transformation of the polymer from an amorphous form to a crystalline form, and drying the hydrogel to form a solid polymer electrolyte with adequate electrical conductivity for use as the electrolyte of a solid-state electrochemical cell.

5,009,971

GAS RECOMBINANT SEPARATOR

Harlan B. Johnson, Rittman; Samuel B. Laferty, Akron; Melvin P. Wagner, Wadsworth, and Shantilal M. Mohnot, Copley, all of Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 240,851, Sep. 2, 1988, abandoned, which is a continuation-in-part of Ser. No. 25,540, Mar. 13, 1987, abandoned. This application Aug. 9, 1989, Ser. No. 391,067

Int. Cl.[5] H01M *2/16*

U.S. Cl. 429—252 50 Claims

30. A separator for an electrolyte gas recombinant battery comprising a non-woven, porous flexible sheet consisting essentially of a substantially homogeneous mixture of from about 93 to about 99.5 weight percent synthetic amorphous silica and from about 0.5 to about 7 weight percent of fibrillated, unsintered polymeric material, said synthetic amorphous silica comprising precipitated silica and from 0 to about 25 weight percent of pyrogenic silica, silica gel or mixtures of pyrogenic silica and silica gel, said sheet having a tensile strength of less than 75 pounds per square inch.

5,009,972

BLANK PLATES FOR FORMING MULTI-COLOR FLUORESCENT PLANES AND METHODS FOR FORMING MULTI-COLOR FLUORESCENT PLANES

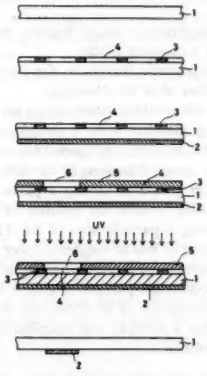
Naoshige Higuchi, Tokyo, and Toru Miyake, Funabashi, both of Japan, assignors to Dai Nippon Printing Co., Ltd., Tokyo, Japan

Filed Mar. 28, 1989, Ser. No. 330,842

Claims priority, application Japan, Mar. 29, 1988, 63-75255; Mar. 29, 1988, 63-75256; Mar. 29, 1988, 63-75257

Int. Cl.[5] G03F *9/00*

U.S. Cl. 430—7 11 Claims



1. A method for forming multi-color fluorescent planes comprising the steps of:

repeating the steps of coating a fluorophore-containing photosensitive layer on one side of a transparent substrate and, thereafter, exposing said photosensitive layer to light from the other side of said transparent substrate, followed by developing, wherein

said photosensitive layer is exposed to light with a combination of a full-color mask including light-transmitting segments to coincidence with every color pattern and a single-color mask including light-transmitting segments corresponding to each color pattern.

5,009,973

IMAGE FORMING METHOD AND IMAGE FORMING APPARATUS

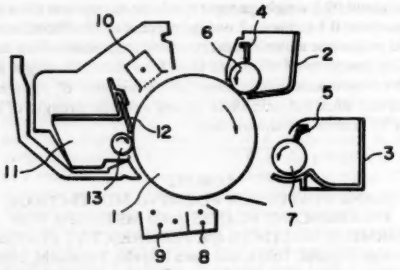
Satoshi Yoshida, Kawasaki; Toshiaki Nakahara, Tokyo; Hirohide Tanikawa, Yokohama, and Kiichiro Sakashita, Inagi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 28, 1989, Ser. No. 317,182

Claims priority, application Japan, Feb. 29, 1988, 63-46890

Int. Cl.[5] G03G *13/01, 13/09, 15/01, 15/09*

U.S. Cl. 430—45 99 Claims



34. An image forming method, comprising:

developing an electrostatic latent image on an electrostatic image-bearing member with a developer comprising a non-magnetic color tonerr having a volume-average particle size of 4 to 15 microns to form a non-magnetic color toner image;

transferring the non-magnetic color toner image on the electrostatic image-bearing member to a transfer-receiving material;

cleaning the electrostatic image-bearing member after the transfer with a cleaning blade;

forming an electrostatic image on the electrostatic image-bearing member after the cleaning;

developing the electrostatic latent image on the electrostatic image-bearing member with a developer comprising a magnetic toner to form a magnetic toner image, wherein the magnetic toner contains 17 to 60% by number of magnetic toner particles having a particle size of 5 microns or smaller, 1–23% by number of magnetic toner particles having a particle size of 8.0–12.7 microns and 2.0% by volume or less of magnetic toner particles having a size of 16 microns or larger, wherein the magnetic toner has a volume-average particle size of 4–9 microns and a degree of aggregation of 50–95%; and wherein the magnetic toner has a particle size distribution satisfying the following formula:

$$N/V = -0.04N + k,$$

where N denotes the value of % by number of magnetic particles having a size of 5 microns or smaller, namely a positive number of 17 to 60, V denotes the value of % by volume of magnetic particles having a size of 5 microns or smaller, and k is a positive number of from 4.5 to 6.5;

transferring the magnetic toner image on the electrostatic image-bearing member to the transfer-receiving material; and

cleaning the electrostatic image-bearing member after the transfer with a cleaning blade.

5,009,974

SURFACE-TREATED METAL BODY, PROCESS FOR PRODUCING THE SAME, PHOTOCONDUCTIVE MEMBER USING THE SAME AND RIGID BALL FOR TREATING METAL BODY SURFACE

Mitsuru Honda, Kashiwa; Atsushi Koike, Chiba; Tomohiro Kimura, Ueno; Kyosuke Ogawa, Nabari, and Keiichi Murai, Kashiwa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 294,995, Jan. 9, 1989, which is a continuation of Ser. No. 894,958, Aug. 8, 1986, abandoned. This application Apr. 27, 1990, Ser. No. 515,229

Claims priority, application Japan, Aug. 10, 1985, 60-176172

Int. Cl.[5] G03G *5/14*

U.S. Cl. 430—69 7 Claims

1. An electrophotographic process comprising:

(a) charging a photoconductive member comprising a photoconductive layer on a support, the support being a surface-treated metal body having irregularities formed through a plurality of spherical indent recesses on the surface and having fine irregularities formed in the spherical indent recesses, wherein the ratio of the radius of curvature R and the width r of the spherical indent recesses are in a range of $0.035 \leqq r/R \leqq 0.5$ and wherein the radius of curvature R of the spherical indent recesses is in a range of $0.1 \text{ mm} \leqq R \leqq 2.0 \text{ mm}$; and

(b) imagewise exposing said photoconductive member with an information-bearing laser beam to thereby form an electrostatic image.

5,009,975

ELECTROPHOTOGRAPHIC PHOTORECEPTOR

Eiichi Kato, and Kazuo Ishii, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 4, 1989, Ser. No. 417,105

Claims priority, application Japan, Oct. 4, 1988, 63-248949; Nov. 17, 1988, 63-288972

Int. Cl.[5] G03G *5/08*

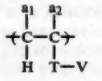
U.S. Cl. 430—96 9 Claims

1. An electrophotographic photoreceptor comprising a support having thereon at least one photoconductive layer containing at least an inorganic photoconductive material and a binder resin, wherein the binder resin contains

(A) at least one resin having a weight average molecular weight of from 1×10^3 to 3×10^4 with at least one substituent selected from the group consisting of $-PO_3H_2$, $-SO_3H$, $-COOH$,

wherein R represents a hydrocarbon group having from 1 to 10 carbon atoms or —OR′, wherein R′ represents a hydrocarbon group having from 1 to 10 carbon atoms, and a cyclic acid anhydride-containing group, being bonded to one of the terminals of the polymer main chain thereof, and

(B) at least one resin having a weight average molecular weight of 5×10^4 or more and containing, as a polymerization component, at least a repeating unit represented by formula (b-i):


(b-i)

wherein T represents —COO—, —OCO—, $-CH_2OCO-$, $-CH_2COO-$, —O— or $-SO_2-$; V represents a hydrocarbon group having from 1 to 22 carbon atoms; and a_1 and a_2, which may the same or different, each represents a hydrogen

atom, a halogen atom, a cyano group, a hydrocarbon group having from 1 to 8 carbon atoms, —COO—Z, or —COO—Z bonded via a hydrocarbon group having from 1 to 8 carbon atoms, wherein Z represents a hydrocarbon group having from 1 to 18 carbon atoms; and wherein said Resin (B) is partially crosslinked.

5,009,976

ELECTROPHOTOGRAPHIC PHOTORECEPTOR

Akira Itoh, and Kozo Haino, both of Tsukuba, Japan, assignors to Mitsubishi Paper Mills Limited, Tokyo, Japan

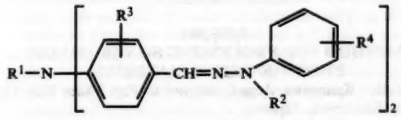
Filed Feb. 26, 1990, Ser. No. 484,836

Claims priority, application Japan, Feb. 27, 1989, 1-048298

Int. Cl.[5] G03G 5/14

U.S. Cl. 430—59 **6 Claims**

1. An electrophotographic photoreceptor which comprises an electroconductive support and, provided thereon, a photosensitive layer which comprises a carrier generation layer containing a carrier generation material and a carrier transport layer containing at least one hydrazone compound as a carrier transport material represented by the following formula (I):



(I)

wherein R^1 and R^2 each represent an alkyl, alkenyl, aralkyl, aryl or heterocyclic group which may be substituted, and at least one of R^1 and R^2 is an alkenyl group and R^3 and R^4 each represents a hydrogen atom, an alkyl group, an alkoxy group or a halogen atom.

5,009,977

PHOTOSENSITIVE MEMBER FOR ELECTROPHOTOGRAPHY HAVING AMORPHOUS SILICON

Takashi Hayakawa, Nara; Shiro Narikawa, Kashihara; Kunio Ohashi, Nara, and Yoshiharu Tsujimoto, Yamatokoriyama, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jun. 21, 1989, Ser. No. 369,473

Claims priority, application Japan, Jun. 28, 1988, 63-161978; Jun. 29, 1988, 63-161209; Jun. 29, 1988, 63-161210

Int. Cl.[5] G03G 5/085

U.S. Cl. 430—84 **18 Claims**

1. A photosensitive member for electrophotography comprising a conductive substrate and a photoconductive layer comprising an amorphous silicon containing 40–60 atomic % of a member selected from the group consisting of hydrogen, halogen and mixtures thereof, and at least one chemical modifier selected from the group consisting of carbon at 5–40 atomic %, nitrogen at 0.01–28 atomic %, and oxygen at 5–25 atomic %, each based on silicon, with said amorphous silicon being deposited utilizing an electron resonance method.

5,009,978

PREPARATION PROCESS FOR TONER POLYMER

Keiji Yoshida; Ryo Funato; Syuji Takahiro, all of Nagoya; Shinji Kubo, Toyohashi, and Notoshi Inagaki, Nogoya, all of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Dec. 8, 1989, Ser. No. 447,854

Claims priority, application Japan, Dec. 12, 1988, 311989

Int. Cl.[5] G03G 9/00, 5/00

U.S. Cl. 430—109 **7 Claims**

1. A process for the preparation of a toner polymer comprising the steps of: carrying out suspension polymerization of a monomer having a polymerizable vinyl group in the presence of polyvinyl alcohol as a dispersant; and conducting oxidative decomposition of said polyvinyl alcohol anchored to polymer particles obtained by said suspension polymerization.

5,009,979

ELECTROSTATOGRAPHIC PARTICULATE TONER AND DEVELOPER COMPOSITIONS

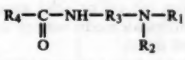
Galina P. Buxton, Tenafly, N.J., and Kuo-Chang Tang, Cheshire, Conn., assignors to Olin Hunt Specialty Products Inc., West Paterson, N.J.

Filed Oct. 23, 1989, Ser. No. 425,546

Int. Cl.[5] G03G 9/00, 5/00

U.S. Cl. 430—110 **18 Claims**

1. A toner composition comprised of resin particles, colorant material and an effective charge controlling amount of at least one charge enhancing additive of the formula:



wherein R_1 and R_2 are lower alkyl groups having 1 to 4 carbon atoms; R_3 is a straight-chain alkylene group having from 1 to about 8 carbon atoms; and R_4 is an alkyl group having from about 7 to about 24 carbon atoms.

5,009,980

AROMATIC NITROGEN-CONTAINING COMPOUNDS AS ADJUVANTS FOR ELECTROSTATIC LIQUID DEVELOPERS

Lyla M. El-Sayed, West Chester, Pa., and Torence J. Trout, Yorklyn, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 30, 1988, Ser. No. 292,192

Int. Cl.[5] G03G 9/12

U.S. Cl. 430—114 **54 Claims**

1. An improved electrostatic liquid developer having improved charging characteristics consisting essentially of

(A) a nonpolar liquid having a Kauri-butanol value of less than 30, present in a major amount,

(B) thermoplastic resin particles having an average by area particle size of less than 10 μm having dispersed therein an aromatic nitrogen-containing compound which is substantially insoluble or immiscible in the nonpolar liquid at ambient temperatures and is selected from the group consisting of

(1) polyvinylpyridines,

(2) polyaminostyrenes,

(3) copolymers of vinyl pyridine, and

(4) compounds of the general formula:

$$Y—(R)_n—Z$$

wherein Y is pyridine, substituted pyridine, bipyridine, aniline, or substituted aniline; R is alkyl of 1 to 30 carbon atoms, substituted alkyl of 1 to 30 carbon atoms, aryl of 6 to 30 carbon atoms, substituted aryl of 6 to 30 carbon atoms, or NH; Z is one of Y; n is 0 or 1; and fused ring compounds can be formed when R is aryl or substituted aryl of n is 0, and

(C) a nonpolar liquid soluble ionic or zwitterionic charge director compound.

27. A process for preparing a liquid electrostatic developer for electrostatic imaging comprising

(A) dispersing at an elevated temperature in a vessel a thermoplastic resin, an aromatic nitrogen-containing compound which is substantially insoluble or immiscible in the nonpolar liquid at ambient temperatures and is selected from the group consisting of

(1) polyvinylpyridines,

(2) polyaminostyrenes,

(3) copolymers of vinyl pyridine, and

(4) compounds of the general formula:

$Y-(R)_n-Z$

wherein Y is pyridine, substituted pyridine, bipyridine, aniline, or substituted aniline; R is alkyl of 1 to 30 carbon atoms, substituted alkyl of 1 to 30 carbon atoms, aryl of 6 to 30 carbon atoms, substituted aryl of 6 to 30 carbon atoms, or NH; Z is one of Y; n is 0 to 1; and fused ring compounds can be formed when R is aryl or substituted aryl or n is 0, and a dispersant nonpolar liquid having a Kauri-butanol value of less than 30, while maintaining the temperature in the vessel at a temperature sufficient to plasticize and liquify the resin and below that at which the dispersant nonpolar liquid degrades and the resin decomposes,

(B) cooling the dispersion, either

(1) without stirring to form a gel or solid mass, followed by shredding the gel or solid mass and grinding by means of particulate media with or without the presence of additional liquid;

(2) with stirring to form a viscous mixture and grinding by means of particulate with or without the presence of additional liquid; or

(3) while grinding by means of particulate media to prevent the formation of a gel or solid mass with or without the presence of additional liquid;

(C) separating the dispersion of thermoplastic toner particles having an average by area particle size of less than 10 μm from the particulate media, and

(D) adding to the dispersion during or subsequent to Step (A) a nonpolar liquid soluble ionic or zwitterionic charge director compound.

5,009,981

PHOTOSENSITIVE COMPOSITION

Shinichi Matsubara; Masafumi Uehara, both of Tokyo; Shinichi Bunya, and Eriko Katahashi, both of Yokohama, all of Japan, assignors to Konica Corporation and Mitsubishi Kasei Corporation, both of Tokyo, Japan

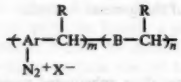
Continuation-in-part of Ser. No. 376,517, Jul. 7, 1989, abandoned. This application Sep. 20, 1990, Ser. No. 585,048

Claims priority, application Japan, Jul. 11, 1988, 63-172240; Jul. 11, 1988, 63-172241; Jul. 11, 1988, 63-172242

Int. Cl.[5] G03C *1/52*

U.S. Cl. 430—175 **9 Claims**

1. A photosensitive composition comprising in admixture a photosensitive diazo compound, having a structure represented by the Formula I:



(I)

wherein ArN_2X is an aromatic having diazonium salt, B is an aromatic having a polymerizable unsaturated bond and R is a hydrogen atom, methyl group or phenyl group, m=1~20, and n=1~20,

a polymeric binder and a photopolymerization initiator.

5,009,982

RESIST INK COMPOSITION

Yuichi Kamayachi, Wako, and Syoji Inagaki, Sakado, both of Japan, assignors to Taiyo Ink Manufacturing Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 850,220, Apr. 10, 1986, abandoned. This application Jun. 6, 1988, Ser. No. 204,927

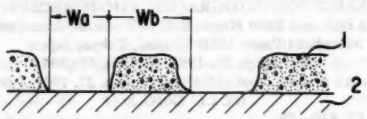
Claims priority, application Japan, Apr. 19, 1985, 60-084987

Int. Cl.[5] G03F *7/031, 7/032;* C08L *63/10;* C08G *59/02*

U.S. Cl. 430—280 **15 Claims**

1. A photosetting and thermosetting liquid resist ink composition developable with a dilute alkaline aqueous solution, which comprises in combination: a photosetting resin composition comprising

(A) a resin curable with an activated energy ray, which has an acid value in the range of 50 to 165 mg KOH/g and is obtained by the reaction of (a) a saturated or unsaturated polybasic acid anhydride with (b) a reaction product of a novolak epoxy compound and an unsaturated monocarboxylic acid in a proportion of 0.95 to 1.05 equivalent weight of said unsaturated monocarboxylic acid to 1 equivalent weight of said novolak epoxy compound,



(B) a photopolymerization initiator, and

(C) a diluent and an epoxy compound containing at least two epoxy groups in one molecule thereof as a thermosetting component.

5,009,983

METHOD FOR PROCESSING SILVER HALIDE PHOTOSENSITIVE MATERIALS

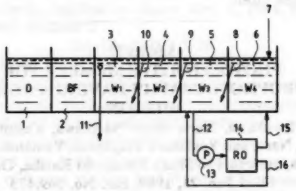
Akira Abe, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 12, 1990, Ser. No. 551,822

Claims priority, application Japan, Jul. 14, 1989, 1-180591

Int. Cl.[5] G03C *7/40*

U.S. Cl. 430—372 **20 Claims**



1. A method for processing silver halide photosensitive materials comprising processing an imagewise-exposed silver halide photosensitive material in a bath which has a fixing ability and then at least one of washing and stabilizing the photosensitive material in a multi-stage counter-flow system, wherein liquid from at least one of a water washing tank and a stabilizing tank is treated using a reverse osmosis membrane and the treated liquid is recycled to at least one of the water washing tank and stabilizing tank, and at least a tank at the stage at which the liquid is removed for the reverse osmosis membrane treatment has an open fraction of not more than 0.03.

5,009,984

METHOD FOR PROCESSING A PHOTOGRAPHIC SILVER HALIDE EMULSION MATERIAL

Gino L. De Rycke, Mortsel; Antonius A. Rutges, Boechout, and Jozef P. De Prijcker, Hamme, all of Belgium, assignors to Agfa-Gevaert, N.V., Mortsel, Belgium

Filed Jun. 29, 1989, Ser. No. 372,856

Claims priority, application Belgium, Aug. 9, 1988, 88201706.4

Int. Cl.[5] G03C *5/26, 5/38*

U.S. Cl. 430—404 **11 Claims**

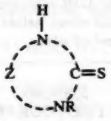
1. A method of processing an imagewise exposed photographic silver halide emulsion material which method comprises the steps of:

(A) developing an image-wise exposed silver halide emulsion layer by means of at least one diffusible developing agent in at least the substantial absence of a silver halide complexing agent, the development taking place with an aqueous alkaline liquid,

(B) bringing the thus developed photographic material while being still wet with the liquid from step (A) with its silver halide emulsion layer side in intimate contact with a water-absorbing layer of a receptor element that contains in an organic hydrophilic colloid binder a silver halide complexing agent and in dispersed colloidal form a metal sulphide capable of a conversion reaction with complexed silver halide to form silver sulphide,

(C) maintaining said photographic material and receptor element in contact to allow the transfer of dissolved complexed silver compound into said receptor element and conversion into silver sulphide until the undeveloped silver halide in the exposed silver halide emulsion layer is substantially completely so transferred and converted, and

(D) separating the photographic material from the receptor element, wherein said water-absorbing layer of said receptor element contains (i) said silver complexing agent at a coverage per m2 of silver halide in the unexposed photographic material, (ii) said metal sulphide at a sulphide ion coverage per m2 at least stoichiometrically equivalent with the silver ion coverage present in the photographic material in unexposed and undeveloped state, and (iii) a diffusible silver image stabilizing agent at a coverage of at least 0.01 g/m2, said stabilizing agent is a cyclic thiourea compound corresponding to the following formula or a tautomeric form thereof:



wherein:

R represent hydrogen or a hydrocarbon group including said group in substituted form, and

Z represents a bivalent saturated hydrocarbon group including said group in substituted form to complete a 5- or 6-membered heterocyclic ring.

5,009,985

IRON COMPLEXES AND BLEACHING BATHS CONTAINING SAME

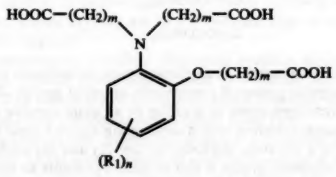
Friedrich-Wilhelm Kunitz, Leverkusen, and Ralf Wichmann, Cologne, both of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 22, 1990, Ser. No. 571,504

Int. Cl.[5] G03C *5/44*

U.S. Cl. 430—430 **7 Claims**

1. Iron(III)-complexes of compounds of the formula



wherein

R_1 denotes a substituent,

m denotes 1 or 2 and

n denotes 0, 1 or 2.

5,009,986

NAPHTHALOCYANINE BASED COMPOUND AND OPTICAL RECORDING MEDIUM CONTAINING THE SAME

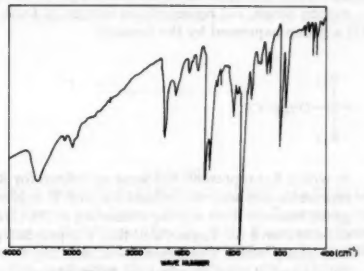
Takayuki Kawaguchi, Hachioji; Takashi Shiro, Hino; Kaoru Iwata, Hachioji, and Takahiro Daido, Hino, all of Japan, assignors to Teijin Limited, Osaka, Japan

Filed Jan. 17, 1990, Ser. No. 466,545

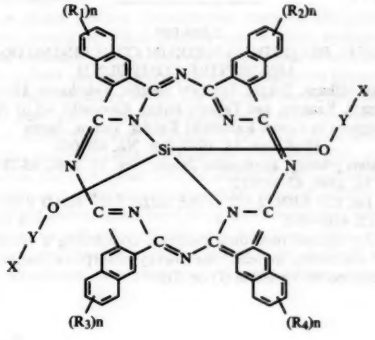
Claims priority, application Japan, Jan. 17, 1989, 1-5888; Feb. 22, 1989, 1-40325

Int. Cl.[5] G03C *1/00, 1/492;* **C09B** *47/04*

U.S. Cl. 430—495 **12 Claims**



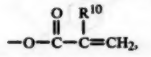
1. A naphthalocyanine based compound expressed by the following formula (I)



(I)

wherein

X represents a group selected from a group consisting of



—CN, and —CH=CH_2; in which R^{10} represents hydrogen atom or methyl group;

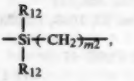
Y groups, which may be the same or different, each represent a divalent group selected from the group consisting of

(1) a saturated aliphatic hydrocarbon group having 2–20 carbon atoms, saturated alicyclic hydrocarbon group having 5–6 carbon atoms, aromatic hydrocarbon group having 6–10 carbon atoms and hydrocarbon group formed by binding the above mentioned groups with each other and having 2–20 total carbon atoms, each optionally substituted with a Group selected from a halogen atom and lower alkyloxy group; which may be substituted with 1 or 2 substituents of X;

(2) a group expressed by the formula —R_{11}—O—R_{1-1}—$_{m1}$— or the group —R_{11}—O—R_{11}—$_{m1}$— which is

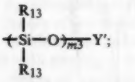
further bound with the saturated alicyclic hydrocarbon group or the aromatic hydrocarbon group defined in above (1); in which R_{11} represents straight chain or branched alkylene group having 2–4 carbon atoms and m1 is an integer of 1–20;

(3) a group expressed by the formula



in which R_{12} represents hydrocarbon group having 1–6 carbon atoms; m2 represents an integer of 1–20; and

(4) a group expressed by the formula



in which R_{13} represents the same as defined for R_{12}; m3 represents the same as defined for m_1; Y' represents a group selected from a group consisting of (1), (2) and (3) defined above for Y; provided that Y represents phenylene group when X represents —CH=CH$_2$;

R_1, R_2, R_3 and R_4 are identical or different and represent hydrogen atom, each straight chain or branched alkyl group, alkoxy group or alkylsilyl group; each having 1–18 carbon atoms; and n represent an integer of 1–4.

5,009,987

OPTICAL RECORDING MEDIUM CONTAINING IR-RAY ABSORPTIVE COMPOUND

Chieko Mihara, Tokyo; Tsuyoshi Santoh, Yokohama; Hiroyuki Sugata, Yamato, and Tetsuro Fukui, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

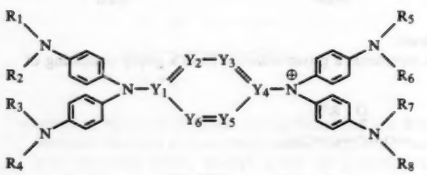
Filed Nov. 14, 1989, Ser. No. 436,041

Claims priority, application Japan, Nov. 16, 1988, 63-287611; Nov. 16, 1988, 63-287612

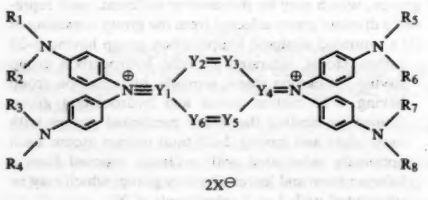
Int. Cl.[5] G03C *1/00, 1/492;* **B32B** *3/02;* **G01D** *9/00*

U.S. Cl. 430—495 **5 Claims**

1. An optical recording medium, comprising a recording layer containing at least one IR-ray absorptive compounds represented by formulae (I) or (II):



(I)



(II)

where Y_1, Y_2, Y_3, Y_4, Y_5, and Y_6 form a substituted or unsubstituted heterocycle which has at least one nitrogen atom; R_1 to R_8 are hydrogen, halogen, or a univalent organic radical, or at least one of the combinations of the atomic groups of R_1 and R_2, R_3 and R_4, R_5 and R_6, and R_7 and R_8 are the same or different; and X^- is an anion.

5,009,988

SILVER HALIDE COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Toshihiko Yagi, Shiroyama, and Yoshitaka Yamada, Hino, both of Japan, assignors to Konica Corporation, Tokyo, Japan

Continuation of Ser. No. 168,444, Mar. 15, 1988, abandoned. This application Aug. 24, 1990, Ser. No. 571,834

Claims priority, application Japan, Mar. 17, 1987, 62-61669

Int. Cl.[5] G03C *1/46*

U.S. Cl. 430—505 **17 Claims**

1. A silver halide color photographic light-sensitive material comprising

(i) a support

(ii) photographic component layers having a total dry thickness of from about 5 μm to 15.1 μm and comprising a red light-sensitive silver halide emulsion layer containing a cyan coupler, a green light-sensitive halide emulsion layer containing a magenta coupler and a blue light sensitive silver halide emulsion layer containing a yellow coupler; and

(iii) a colloidal layer containing substantially non light sensitive fine-grain silver halide grains having an average grain size of not larger than about 0.3 μm, said colloidal layer being positioned farther from said support than said photographic component layers,

wherein at least one of said silver halide emulsion layers contains a diffusible DIR compound and the total silver halide content of said silver halide emulsion layers is from 3.0 g/m^2 to 6.0 g/m^2 of silver.

5,009,989

SILVER HALIDE PHOTOGRAPHIC MATERIAL

Kozo Aoki, and Osamu Takahashi, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

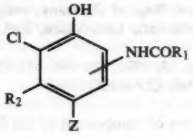
Filed Sep. 19, 1988, Ser. No. 246,585

Claims priority, application Japan, Sep. 17, 1987, 62-233565

Int. Cl.[5] G03C *1/84, 7/34*

U.S. Cl. 430—512 **8 Claims**

1. A silver halide photographic material which contains, on a support, at least one cyan dye-forming coupler represented by the following formula (I), and at least one compound selected from among those represented by the following formulae (II) and (III);



(I)

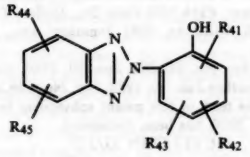
$$L_1(COOR_3)_n \quad \text{(II)}$$

$$L_2(OCOR_4)_m \quad \text{(III)}$$

wherein R_1 represents an aliphatic group, an aromatic group or a heterocyclic group; R_2 represents an ethyl group, Z represents a hydrogen atom, or a group or an atom capable of splitting off upon coupling with a developing agent; L_1 and L_2 each represents a divalent aliphatic group; R_3 and R_4 each represents an aliphatic group; n and m each represents an integer of 2, and the n R_3's and m R_4's, respectively, may be the same of different, L_2 excludes cyclohexylene group; wherein the total number of carbon atoms in the compound represented by formula (II) is from 12 to 60 and the total number of carbon atoms in the compound represented by formula (III) is from 12

to 60, and wherein said compound represented by formula (I) and said at least one compound represented by formula (II) or (III) are present in the same layer.

7. A silver halide photographic material as in claim 1, further comprising an ultraviolet absorbent represented by formula (XI):



(XI)

wherein R_{41}, R_{42}, R_{43}, R_{44} and R_{45}, which may be the same or different, each being a hydrogen atom or a substituent group; R_{44} and R_{45} may combine with each other to complete a 5- or 6-membered aromatic a carbon ring and these groups and this aromatic ring may further be substituted by a substituent group.

5,009,990

PHOTOGRAPHIC RECORDING MATERIAL

Rainer Scheerer, Cologne, and Franz Moll, Leverkusen, both of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 156,582, Feb. 16, 1988, abandoned.
This application Nov. 20, 1989, Ser. No. 440,463
Claims priority, application Fed. Rep. of Germany, Feb. 26, 1987, 3706199
Int. Cl.[5] G03C *1/30, 1/34*
U.S. Cl. 430—539 4 Claims

1. Photographic black and white negative film having on a layer support at least one silver halide emulsion layer containing gelatine, at least one protective layer and at least one hardening layer, in which the protective layer is further removed from the layer support than any silver halide emulsion layer and the hardening layer is further removed from the layer support than any other layer and contains an effective quantity of at least one instant hardener, characterized in that the protective layer contains an effective quantity of 4-hydroxy-6-methyl-1,3,3a,7-tetraazaindene.

5,009,991

SILVER HALIDE EMULSIONS CONTAINING TWINNED SILVER HALIDE CRYSTALS

Clive W. Mowforth, Kingshill; James F. Bullock, Macclesfield; Trevor J. Maternaghan, Knutsford, and Karen N. Harvey, Warrington, all of United Kingdom, assignors to Ilford Limited, Cheshire, United Kingdom

Filed Aug. 31, 1989, Ser. No. 400,659
Int. Cl.[5] G03C *1/02*
U.S. Cl. 430—567 22 Claims

1. A method of preparing a silver halide emulsion wherein the silver halide crystals are of the twinned type which comprises the steps of

(a) providing in a colloid dispersing medium silver halide seed crystals containing at least 90% iodide and at least 80% of which are of hexagonal lattice structure with each displaying predominantly a single basal face,

(b) mixing in the dispersing medium containing the said silver halide seed crystals an aqueous solution of an alkali metal or ammonium bromide or chloride (or mixtures thereof) so forming twinned silver halide crystals containing iodide and the halide or halides being added, and

(c) continuing the addition of said silver halide until dissolution of said seed crystals is substantially complete.

5,009,992

PHOTOGRAPHIC SILVER HALIDE EMULSION

Wolfgang Friedrich, Rödermark, and Alfred Wörsching, Rodgau-Jügesheim, both of Fed. Rep. of Germany, assignors to E. I. DuPont de Nemours and Company, Wilmington, Del.

Filed Dec. 20, 1989, Ser. No. 453,833
Claims priority, application Fed. Rep. of Germany, Jan. 18, 1989, 3901268
Int. Cl.[5] G03C *1/02*
U.S. Cl. 430—573 10 Claims

1. Photographic silver halide emulsion consisting essentially of said emulsion containing therein a dye present in a sensitizing amount to sensitize the emulsion for the infrared spectral region, and an aromatic thiosulfonic acid or a salt of the acid in amount of from 0.1 to 5 millimoles per mole of silver halide.

5,009,993

DIRECT POSITIVE PHOTOGRAPHIC MATERIAL

Noriyuki Inoue, and Tatsuo Heki, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Division of Ser. No. 101,693, Sep. 28, 1987, Pat. No. 4,880,727.
This application Oct. 16, 1989, Ser. No. 422,268
Claims priority, application Japan, Sep. 26, 1986, 61-226292; Sep. 26, 1986, 61-226295
Int. Cl.[5] G03C *1/09*
U.S. Cl. 430—605 5 Claims

1. A direct positive photographic material comprising a support having provided thereon one or more hydrophillic colloid containing layers, wherein at least oen of said hydrophillic colloid containing layers is an internal latent image type silver halide emulsion which has not been previously fogged and at least one of said emulsion layer or other hydrophillic colloid containing layer contains a colloidal metal selected from the group consisting of mercury, iron, lead, zinc, nickel, cadmium, tin, chromium, copper, cobalt, gold, platinum and palladium or a colloidal water-insoluble metallic sulfide, selenide or telluride selected from the group consising of sulfides, selenides, or tellurides of mercury, iron, lead, zinc, nickel, cadmium, tin, chromium, copper, cobalt, gold, platinum, palladium, alluminum, silver, antimony, bismuth, cerium or magnesium.

5,009,994

PARTICLES CONTAINING MANNITOL SUITABLE FOR TABLETTING INTO DIAGNOSTIC REAGENTS

John K. McGeehan, Woodbury, N.J., assignor to EM Diagnostic Systems, Inc., Gibbstown, N.J.

Division of Ser. No. 842,968, Mar. 24, 1986, Pat. No. 4,820,627.
This application Jan. 12, 1989, Ser. No. 296,178
Int. Cl.[5] C12Q *1/00*
U.S. Cl. 435—4 54 Claims

1. A mass of particles suitable for the production of a diagnostic reagent, said particles consisting essentially of an inert, completely water-soluble, solid, particulate bulking agent comprising mannitol, said particulate bulking agent having a coating thereon, at lest in part, of a labile biochemical, said labile biochemical being useful as a diagnostic reagent, wherein said labile biochemical is substantially uniformly distributed on said mass of particles and said mass of particles is substantially free of non-easily breakable agglomerates.

5,009,995

MONOCLONAL ANTIBODIES TO MELANOMA CELLS

Anthony Albino, New York; Kenneth Lloyd, Bronx, both of N.Y.; Hisami Ikeda, Asahikawa, Japan, and Lloyd Old, New York, N.Y., assignors to Sloan-Kettering Institute for Cancer Research, New York, N.Y.

Continuation of Ser. No. 924,144, Oct. 27, 1986, which is a continuation of Ser. No. 481,378, Apr. 1, 1983, abandoned. This application Mar. 11, 1988, Ser. No. 166,660

Int. Cl.[5] G01N *33/535;* C07K *15/28;* C12N *5/18;* A61K *39/00*

U.S. Cl. 435—7.23 7 Claims

1. Monoclonal antibodies which specifically bind to the gp130 glycoprotein cell surface antigen of human melanoma cells, wherein said monoclonal antibodies are selected from the group consisting of monoclonal antibodies 829 and 986 produced by the hybridomas having the A.T.C.C. accesion numbers HB 8289 and HB 9721, respectively.

5,009,996

TWO SITE CROSS-REACTION IMMUNOMETRIC SANDWICH ASSAY METHOD

Vipin D. Shah, Saratoga, Calif.; Padmaker V. Kulkarni, Dallas, Tex., and Quirinus R. Miranda, San Jose, Calif., assignors to International Immunoassay Laboratories, Inc., Santa Clara, Calif.

Continuation of Ser. No. 165,001, Jun. 30, 1980, abandoned. This application Sep. 30, 1983, Ser. No. 537,947

The portion of the term of this patent subsequent to Apr. 23, 2008, has been disclaimed.

Int. Cl.[5] G01N *33/53;* C12Q *1/50*

U.S. Cl. 435—7 11 Claims

1. A two-site immunometric sandwich assay method for the detection and measurement of an analyte of interest in a test sample, said analyte of interest having at least two immunochemically differing binding sites, comprising:

(a) combining a first antibody, raised against a material other than said analyte of interest and capable of cross-reacting with one of said at least two binding sites of said analyte of interest, with a test sample suspected of containing said analyte of interest and a solid material capable of specifically binding to said first antibody, to form a first reaction medium, and simultaneously reacting the components of said first reaction medium to form a bound complex of said solid material to said first antibody, which first antibody is further bound with any other reactants in said test sample which are capable of immunochemically binding to said first antibody;

(b) separating the solid phase from the liquid phase of the reaction medium;

(c) reacting said solid phase, in a second reaction medium, with a second antibody, said second antibody having been raised against a material other than said analyte of interest and being capable of cross-reacting with another of said at least two binding sites of said analyte of interest, and said second antibody being tagged with a means for making said tagged antibody detectable;

(d) separating the solid phase portion of said second reaction medium from the liquid phase portion thereof; and

(e) testing said solid portion to detect the quantity of said second antibody therein as an indication of the presence of said analyte of interest,

wherein said analyte of interest and said materials other than said analyte of interest against which said first and second antibodies have been raised are three different but related molecules, wherein said other materials may be representationally depicted as AA and CC, wherein A and C are binding sites on the materials, and said analyte of interest is a hybrid AC of the other two materials, and wherein the molecular structure of the A binding sites in AA and AC, and the C binding sites in CC and AC are sufficiently similar to permit cross-reaction therebetween by antibodies raised against either material, said first and second antibodies being selected such that they will not both cross-react with any analyte in the test sample other than said analyte of interest.

5,009,997

TWO SITE CROSS-REACTION IMMUNOMETRIC SANDWICH ASSAY METHOD

Vipin D. Shah, 13568 Debbie La., Saratoga, Calif. 95070; Padmakar v. Kulkarni, 6914 Mill Falls Dr., Dallas, Tex. 75248, and Quirinus R. Miranda, 2097 Jonathan Ave., San Jose, Calif. 95125

Continuation of Ser. No. 165,001, Jun. 30, 1980, abandoned. This application Jan. 30, 1985, Ser. No. 896,353

The portion of the term of this patent subsequent to Apr. 23, 2008, has been disclaimed.

Int. Cl.[5] G01N *33/573*

U.S. Cl. 435—7.4 13 Claims

1. In a two-site immunometric sandwich assay method for the detection and measurement of an analyte of interest in a test sample, said analyte of interest having at least two immunochemically differing binding sites, comprising (a) immobilizing a first antibody capable of binding to one said at least two binding sites of said analyte of interest, by binding said first antibody to a solid material, (b) reacting said bound first antibody with a test sample suspected of containing said analyte of interest, to form a reaction medium comprising a liquid phase and a solid phase which medium includes a bound complex of said solid material to said first antibody and said first antibody to any reactants in said test sample which immunochemically bind thereto, (c) separating the solid phase from the liquid phase of the reaction medium, (d) reacting said solid phase, in a second reaction medium, with a second antibody capable of binding to another of said at least two binding sites of said analyte of interest, said second antibody being tagged with a means for making said tagged antibody detectable, (e) separating the solid phase portion of said second reaction medium from the liquid phase portion thereof, and (f) testing said solid portion to detect the quantity of said second antibody therein as an indication of the presence of said analyte of interest, the improvement wherein.

each of said first and second antibodies have been raised against a material other than said analyte of interest and each is capable of cross-reacting with one of said binding sites of said analyte of interest, and

said analyte of interest and said materials other than said analyte of interest against which said first and second antibodies have been raised are three different but related molecules, wherein said other materials may be representationally depicted as AA and CC, where A and C are binding site on the materials, and said analyte of interest is a hybrid AC of the other two materials, and wherein the molecular structure of the A binding sites in AA and AC, and the C binding sites in CC and AC are sufficiently similar to permit cross reaction therebetween by anitbodies raised against either material, said first and second antibodies being selected such that they will not both cross-react with any analyte in the test sample other than said analyte of interest.

5,009,998

METHOD FOR PERFORMING HETEROGENEOUS IMMUNOASSAY

Allan T. Chow, Wilmington, Del., and Michael A. G. Luddy, West Chester, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 66,583, Jun. 26, 1987, abandoned. This application Nov. 3, 1987, Ser. No. 115,506

The portion of the term of this patent subsequent to Nov. 20, 2007, has been disclaimed.

Int. Cl.[5] G01N *33/53, 33/543, 33/545;* C12N *11/00*

U.S. Cl. 435—7.92 3 Claims

1. A method of performing a heterogeneous immunoassay on a sample for the determination of a biological analyte, using

a solid support defining a container capable of the reversible immobilization of binding partners of the analyte, comprising the steps of:

coating substantially all of the interior of the support with a binding partner of the analyte,

introducing the sample and an anti-analyte-label conjugate into the support,

capping the support,

agitating the support end-over-end in a controlled temperature environment for a controlled time to subject substantially all of the interior of the support to a thin layer of the sample and conjugate to form a labelled complex bound to such coating, thereby to reduce the diffusion time required for all portions of the sample and anti-analyte-label conjugate to come in contact with the support, separating non-reacted components of the sample and anti-analyte-label conjugate from the support,

releasing the label complex from the coating using salts or organic bases, and

measuring the activity of the label.

5,009,999

METHOD FOR BIODEGRADING PCBS

Lawrence H. Bopp, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 866,501, May 23, 1986, Pat. No. 4,843,009. This application Mar. 20, 1989, Ser. No. 325,739

Int. Cl.[5] C12Q *1/02*; C10G *17/00, 45/00*

U.S. Cl. 435—29 **9 Claims**

1. An enrichment procedure for isolating microorganisms capable of biodegrading PCB cogeners which comprises,

(1) cogeners selected from the class of cogeners free of vicinal hydrogen atoms, cogeners having unchlorinated 2,3 positions, cogeners having unchlorinated 3,4 positions, and cogeners unchlorinated in both 2,3 and 3,4 positions,

(2) agitating under aerobic conditions for a period of at least 24 hours and at a temperature of from about 15° C. to 37° C. a mixture comprising

(a) a PCB contaminated environmental sample

(b) mineral salts medium,

(c) biphenyl, and

(d) a monochlorobiphenyl-containing PCB mixture having at least 15% by weight chlorine,

(3) making several serial dilutions of the mixture of (2) at concentrations of 10^{-2} to 10^{-6},

(4) plating aliquots of the dilutions on solid medium containing biphenyl as sole carbon and energy source, and

(5) selecting clones.

5,010,000

METHOD FOR THE PREPARATION OF A SELECTED PROTEIN OR A PART THEREOF IN BACILLUS STRAIN BACTERIA

Ilkka Palva, Helsinki, Finland, assignor to Genesit Oy and Oy Alko AB, both of Helsinki, Finland

Continuation of Ser. No. 520,036, Aug. 3, 1983, abandoned, which is a continuation-in-part of Ser. No. 336,405, Dec. 31, 1981, abandoned. This application Nov. 30, 1987, Ser. No. 129,356

Claims priority, application Finland, Dec. 31, 1980, 804081

Int. Cl.[5] C12P *21/00*; C12N *15/00, 1/20, 9/86*

U.S. Cl. 435—69.1 **8 Claims**

1. A method for the preparation of a selected protein or polypeptide in Bacillus strain bacteria by joining DNA coding for the selected protein or polypeptide to a bacterium gene, comprising the successive steps of:

(1) cleaving the *Bacillus amyloliquefaciens* gene for α-amylase at a location to the 3' side of the excretion signal downstream from the regulation signal of the α-amylase gene or at a location downstream from a portion of the DNA sequence essential with respect to excretion of the α-amylase protein;

(2) joining the cleaved gene to a plasmid present in Bacillus strain bacteria;

(3) joining the DNA sequence coding for the selected protein or polypeptide to the cleavage site;

(4) transforming the Bacillus strain host bacteria with the recombinant DNA molecules so obtained; and

(5) cultivating the transformed host bacteria for producing the selected protein or polypeptide.

5,010,001

PREPARATION OF NATURAL OR MODIFIED INSECT TOXINS

Thomas J. Pollock, San Diego, Calif., assignor to Syntro Corporation, Lenexa, Kans.

Continuation-in-part of Ser. No. 573,535, Jan. 25, 1984, abandoned, which is a continuation-in-part of Ser. No. 466,744, Feb. 13, 1983, abandoned. This application Mar. 28, 1985, Ser. No. 717,043

Int. Cl.[5] C12N *1/21, 15/00, 15/32*

U.S. Cl. 435—69.1 **7 Claims**

1. A method for producing *B. thuringiensis* delta-endotoxin in enhanced amounts which comprises:

growing transformed *E. coli* in an appropriate nutrient medium, wherein said *E. coli* are transformed with an expression vector containing the intact structural gene encoding said delta-endotoxin and 3' and 5' flanking regions which do not extend beyond the proximal HincII sites; and

isolating the expressed delta-endotoxin.

5,010,002

HUMAN T-PA PRODUCTION USING VECTORS CODING DHFR PROTEIN

Arthur Levinson, Burlingame; Christian Simonsen, and Elizabeth M. Yelverton, both of San Jose, all of Calif., assignors to Genentech, Inc., San Francisco, Calif.

Continuation of Ser. No. 149,990, Jan. 27, 1988, abandoned, which is a continuation of Ser. No. 459,153, Jan. 19, 1983, abandoned. This application Mar. 22, 1990, Ser. No. 499,209

Int. Cl.[5] C12N *15/00, 5/16*; C12P *21/02*

U.S. Cl. 435—69.2 **11 Claims**

1. An expression vector which comprises:

a first DNA sequence encoding a DHFR protein; and

a second DNA sequence encoding human tPA;

wherein each of said first and second sequences is operably linked to a DNA sequence capable of effecting its expression.

5,010,003

USE OF YEAST HOMOLOGOUS SIGNALS TO SECRETE HETEROLOGOUS PROTEINS

Chung N. Chang, San Mateo; Ronald A. Hitzeman, Pacifica, and Mark D. Matteucci, San Francisco, all of Calif., assignors to Genentech, Inc., South San Francisco, Calif.

Continuation of Ser. No. 488,387, Apr. 25, 1983, abandoned. This application Jun. 20, 1990, Ser. No. 541,186

Int. Cl.[5] C12P *21/00, 21/02*; C12N *15/00*

U.S. Cl. 435—69.9 **11 Claims**

1. A yeast expression vehicle comprising the DNA sequence of a yeast promoter operably linked to a DNA sequence encoding a homologous yeast signal peptide, the final codon of the signal peptide being connected in translation reading frame to a DNA sequence encoding a protein heterologous to the yeast organism, provided that said homologous yeast signal peptide is sufficient, upon expression of a fusion protein containing said signal peptide and heterologous protein, to result in the processing and export of mature heterologous protein into the culture medium of yeast organisms transformed with said vehicle, said heterologous protein being completely processed to the mature form.

5,010,004

METHOD FOR CONTINUOUS REACTION WITH FLUIDIZED IMMOBILIZED LIPASE

Yoshitsugu Kosugi; Hideoki Tanaka, both of Tsukuba; Hideo Suzuki, Tokyo, and Masaru Shiraki, Tsukuba, all of Japan, assignors to Agency of Industrial Science & Technology and Ministry of International Trade & Industry, both of Tokyo, Japan

Filed Oct. 11, 1988, Ser. No. 255,599

Claims priority, application Japan, Oct. 9, 1987, 62-255057

Int. Cl.[5] C12P *7/64*; C12N *11/08, 9/20*; C12M *1/40*

U.S. Cl. 435—134 **13 Claims**

1. A method for continuous reaction of a water-soluble substrate and an oily substrate in the presence of fluidized immobilized lipase, which comprises:

(a) providing a reaction vessel having (i) vertically maintained apart upper and lower conically-shaped separation regions, respectively, for separation of a water-soluble product and an oily product, (ii) a plurality of lipase reaction zones each containing immobilized lipase capable of being fluidized and containing therein agitating means and (iii) a plurality of intermediate separation zones for separation of an oily substance and a water-soluble substance, said lipase reaction zones and said intermediate separation zones being disposed alternately between said upper and lower conically-shaped separation regions, and boundaries between said lipase reaction zones and intermediate separation zones being pervious to liquid but impervious to said immobilized lipase;

(b) feeding said water-soluble substrate into a lower part of the upper conically-shaped separation region and said oily substrate into an upper part of the lower conically-shaped separation region;

(c) passing said water-soluble substrate and said oily substrate in counterflow contact through said lipase reaction zones and said intermediate separation zones whereby said immobilized lipase in a fluidized contact with said oily substrate and said water-soluble substrate state comes into mutual; and

(d) recovering oily product-containing liquid from an upper part of said upper conically-shaped separation region and water-soluble product-containing liquid from a lower part of said lower conically-shaped separation region.

5,010,005

BIO-OXIDATION OF HIGH ALCOHOLS IN NON-AQUEOUS REACTION MEDIA

Sheldon J. B. Duff, 35 Merritt Ave., Ottawa, Ontario, Canada K1S 0J5 , and William D. Murray, 868 Champman Blvd., Ottawa, Ontario, Canada K1G 1V2

Filed Apr. 24, 1990, Ser. No. 513,765

Claims priority, application Canada, Apr. 28, 1989, 599191

Int. Cl.[5] C12R *1/84*; C12P *7/24*

U.S. Cl. 435—147 **18 Claims**

1. A method of oxidizing poorly water soluble aliphatic alcohols and aromatic alcohols to their corresponding aldehydes comprising contacting the alcohol with methanol-induced methylotrophic yeast alcohol oxidase in a biphasic reaction medium which comprises an organic phase component and an aqueous phase component such that the alcohol is partitioned between the phases and the aldehyde is partitioned in the organic phase, the volume of aqueous phase being small relative to the volume of organic phase.

5,010,006

LIPASE IMMDOILIZED BY CROSS-LINKING WITH INERT PROTEIN FOR GLYCERIDE SYNTHESIS

Francoise Ergan; Michael Trani, both of Montreal, and Gërald Andre, Ile Bizard, all of Canada, assignors to Her Majesty the Queen in Right of Canada as represented by the National Research Council of Canada, Ottawa, Canada

Filed Aug. 11, 1988, Ser. No. 231,221

Int. Cl.[5] C12N *11/02, 11/00*; C12P *7/64*

U.S. Cl. 435—177 **16 Claims**

1. A dry porous macromolecular matrix comprising a cross-linked mixture of 69.9 to 86.6% by weight of an inert protein and 0.4 to 10.2% by weight of a lipase enzyme and a cross-linking agent, the amount of cross-linking agent being about 11.7 to 23% by weight, said matrix being obtained by a process comprising:

(i) adding to a buffer solution about 50 to 440 μl lipase enzyme, about 5% inert protein and about 0.75 to 1.5% bifunctional cross-linking agent and allowing the resultant mixture to react;

(ii) freezing the resulting reacted mixture at a temperature ranging between −20° C. and −195° C.;

(iii) allowing the frozen mixture to thaw to a temperature ranging from 4° to 25° C.; and

(iv) rinsing and drying the resulting product at room temperature to produce said dry porous macromolecular matrix.

5,010,007

COMPOSITION FOR REMOVING OXYGEN IN FOODSTUFF AND DRINKS

Jean-Paul Prieels; Charles Maschelein, and Marc Heilporn, all of Brussels, Belgium, assignors to Synfina-Oleofina, Brussels, Belgium

Division of Ser. No. 863,269, May 14, 1986, Pat. No. 4,957,749. This application Mar. 12, 1990, Ser. No. 492,031

Int. Cl.[5] C12N *9/04, 9/08*

U.S. Cl. 435—190 **3 Claims**

1. An enzyme composition for removing molecular and free-radical oxygen from oxidizable foodstuff materials, comprising:

(a) from about 0.1 to about 1 ppm/1 of medium of an oxidase,

(b) from about 0.05 to about 2%, based on the medium, of a substrate corresponding to the oxidase,

(c) from about 2,000 to about 20,000 units/1 of medium of catalase, and

(d) from about 0.3 to about 1.5 ppm of superoxide dismutase.

5,010,008

STABLE LIQUID ENZYME CONCENTRATE AND PROCESS FOR ITS PRODUCTION

Phillip J. Brumm, Lake Zurich, Ill., assignor to Enzyme Bio-Systems Ltd., Englewood Cliffs, N.J.

Filed Dec. 12, 1988, Ser. No. 282,644

Int. Cl.[5] C12N *9/28*

U.S. Cl. 435—202 **12 Claims**

1. A process for producing a stable liquid enzyme concentrate containing the alpha-amylase from *Bacillus stearothermophilus* which consists essentially of the steps of:

(a) mixing an aqueous solution of *Bacillus stearothermophilus* alpha-amylase enzyme with granular starch to adsorb the alpha-amylase enzyme;

(b) separating the starch, containing adsorbed alpha-amylase enzyme, from the aqueous solution;

(c) washing the starch containing adsorbed alpha-amylase enzyme;

(d) forming a slurry of the starch containing adsorbed alpha-amylase enzyme in a buffer solution containing calcium ion;

(e) heating the slurry of Step (d) above the gelatinization temperature of the starch to form a solution of the alpha-amylase enzyme and starch hydrolyzate;

(f) separating the solution formed in Step (e) from any insoluble solid; and

(g) concentrating the solution obtained in Step (f).

5,010,009

MATERIAL FOR CELL ATTACHMENT AND GROWTH

John Steele, North Rocks; Oddvar Johansen, Mulgrave; Graham Johnson, Peakhurst, and Johnathon Hodgkin, Burwood, all of Australia, assignors to Commonwealth Scientific & Industrial Research Organisation & Telectronics Pty. Limited, Australia

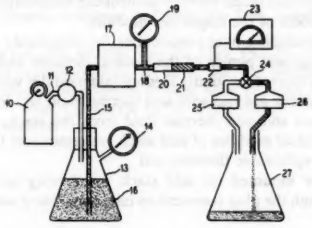
PCT No. PCT/AU89/00356, § 371 Date May 9, 1990, § 102(e) Date May 9, 1990, PCT Pub. No. WO90/02145, PCT Pub. Date Mar. 8, 1990

PCT Filed Aug. 22, 1989, Ser. No. 477,884

Claims priority, application Australia, Aug. 22, 1988, PJ0020

Int. Cl.[5] C12N *5/02;* A61K *47/00*

U.S. Cl. 435—240.243 17 Claims



15. A method of promoting cell attachment and growth on a surface, said method comprising the steps of:

(a) preparing a surface by:

(i) grafting polyacrylic acid chains to a fluorocarbon polymer substrate so that the weight of the fluorocarbon polymer substrate increases by between 0.1% and 20%,

(ii) treating the fluorocarbon polymer surface produced by step (i) with concentrated sulphuric acid at a sufficiently high temperature and for a sufficient time to separately decarboxylate, aromatize and sulphonate an effective proportion of the grafted polyacrylic acid chains,

(iii) drying the surface produced by step (ii),

(iv) soaking the surface produced by step (iii) in a concentrated acid,

(v) neutralizing the surface produced by step (iv); and

(b) exposing said surface to cells.

5,010,010

PRODUCTION OF HUMAN PARATHYROID HORMONE FROM MICROORGANISMS

Kaare M. Gautvik, Oslo; Peter Alestrom, Sollibogda; Tordis B. Oven, and Odd S. Gabrielsen, both of Oslo, all of Norway, assignors to Selmer-Sande, A.S., Norway

Continuation of Ser. No. 921,684, Oct. 22, 1986, abandoned. This application Aug. 14, 1989, Ser. No. 393,851

Int. Cl.[5] C12P *21/00, 21/02;* C12N *1/20, 5/00*

U.S. Cl. 435—252.3 38 Claims

1. A DNA sequence encoding Saccharomyces mating factor alpha 1 operably linked to human parathyroid hormone wherein said DNA sequence can stably transform a yeast cell to express and secrete an intact human parathyroid hormone.

5,010,011

BOVINE PLACENTAL LACTOGEN GENE

Linda A. Schuler, Madison; Jack Gorski, Middleton, both of Wis.; Walter L. Hurley, Urbana, Ill.; Robert D. Bremel, Madison, Wis., and Fritz M. Rottman, Pepper Pike, Ohio, assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Continuation-in-part of Ser. No. 717,078, Mar. 28, 1985, Pat. No. 4,767,711. This application Apr. 21, 1988, Ser. No. 184,901

The portion of the term of this patent subsequent to Aug. 30, 2005, has been disclaimed.

Int. Cl.[5] C12N *15/00, 15/16, 15/63*

U.S. Cl. 435—252.3 3 Claims

1. A recombinant vector, comprising:

a vector; and

a foreign cDNA sequence coding for bovine placental lactogen which has been inserted into said vector; wherein the bovine placental lactogen is one coded for by a bovine gene portion of pbPL1078.

5,010,012

PROCESS FOR THE ENZYMATIC PREPARATION OF OPTICALLY ACTIVE PHOSPHORUS CONTAINING FUNCTIONAL ACETIC ACID DERIVATIVES

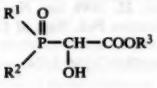
Dieter Wullbrandt, Hofheim am Taunus; Reinhold Keller, Bad Soden am Taunus; Merten Schlingmann, Königstein/Taunus; Wolfgang Holla, Hofheim am Taunus, and Manfred Schneider, Wuppertal, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Aug. 12, 1988, Ser. No. 231,290

Int. Cl.[5] C12P *7/00*

U.S. Cl. 435—280 7 Claims

1. A process for resolving the racemate of a compound of the formula I



I

in which R^1 and R^2 are C_1 to C_4 alkyl, and

R^3 is C_1 to C_{18} alkyl,

which comprises incubation of the said compound in aqueous or aqueous-organic medium with an esterase, lipase or esterase and lipase.

5,010,013

ROLLER BOTTLE FOR TISSUE CULTURE GROWTH

Jonathan M. Serkes, Oak View, and William L. Foschaar, Camarillo, all of Calif., assignors to In Vitro Scientific Products, Inc., Ventura, Calif.

Continuation-in-part of Ser. No. 130,740, Dec. 9, 1987, Pat. No. 4,824,787. This application Jun. 2, 1988, Ser. No. 201,429

The portion of the term of this patent subsequent to Apr. 25, 2006, has been disclaimed.

Int. Cl.[5] C12M *3/04*

U.S. Cl. 435—285 25 Claims

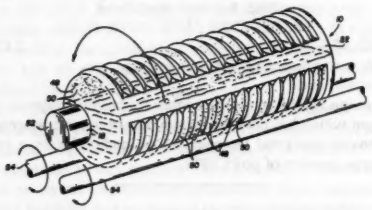
1. A roller bottle for tissue culture growth comprising in combination:

a substantially cylindrical wall section having a central axis and containing a pleated segment having an upper edge and a lower edge;

the pleated segment including at least one unpleated, axial panel for forming a drain channel for emptying the contents of the bottle, a plurality of unpleated, axial support ribs, each rib being narrower than said panel and a plurality of pleats disposed crosswise to the axis of the bottle, each of the pleats containing an outer rim disposed in a common cylindrical plane and forming a trough on the inside surface of the segment;

each of the panels being connected to said troughs, being disposed no nearer to said central axis than said common cylindrical plane and extending substantially from the upper edge to the lower edge of the cylindrical segment said panels and support ribs forming at least 5% of the circumference of cylindrical wall section;

said roller bottle having an inner surface area at least 110% the surface area of a roller bottle having an unpleated



cylindrical segment having the same external diameter said roller bottle having an interior surface that has been radiation treated to be wettable for cell attachment and growth;

a top section of the bottle having a neck connected to the cylindrical wall section; and

a bottom section of the bottle connected to the cylindrical wall section.

5,010,014

PERIFUSION APPARATUS FOR CULTURING LIVING CELLS AND PERIFUSION CULTURING PROCESS

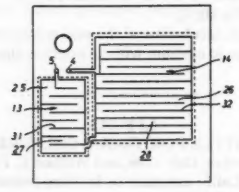
Rolf Gebhardt, Dornäckerweg 13,, 7400 Tübingen 7, Fed. Rep. of Germany

Continuation of Ser. No. 886, Jan. 6, 1987, abandoned. This application Nov. 21, 1989, Ser. No. 441,338

Claims priority, application Fed. Rep. of Germany, Jan. 10, 1986, 3600487

Int. Cl.[5] C12M *1/14*

U.S. Cl. 435—310 **5 Claims**



1. A perifusion culture apparatus comprising:

a horizontal assembly for vertical culturing modules each of flat rectangular configuration having opposite broad faces and comprising between said faces:

an oxygenation chamber subdivided by a gas permeable wall parallel to said faces into an oxygen compartment and a liquid culture medium compartment provided internally with means defining an upwardly extending meandering gas path and a downwardly extending meandering liquid path in counterflow to said gas path, respectively,

a culture chamber adjacent and coplanar with said oxygenation chamber and subdivided by a gas permeable wall parallel to said faces into a gas compartment and a culturing compartment, respectively,

a culture support removably received in said culturing compartment lying parallel to said faces and removable from said module with a culture thereon,

an inlet passage for an oxygen containing gas communicating with an upper part of said gas compartment, said gas compartment communicating at a bottom thereof with said oxygen compartment of said oxygenation chamber,

an outlet passage connected to an upper portion of said oxygen compartment of said oxygenation chamber,

a pump on said module connected to said liquid culture medium compartment of said oxygenation chamber for delivering a liquid culture medium to be oxygenated to said liquid culture medium compartment at an upper part thereof,

means in said module for connecting a lower portion of said liquid culture medium compartment with said culturing compartment and for distributing an oxygenated culture medium all across a bottom of said culturing compartment, whereby said oxygenated medium passes upwardly therein and completely fills said culturing compartment,

means for removing said culture medium communicating with said culturing compartment at a top thereof, and

passages for a thermal fluid formed in said module;

a respective thermal control device connected with said passages for said thermal fluid coextensive with each of said modules and lying along and in surface contact with one of said faces, thereby controlling temperature in said chambers of the respective module;

means including plug connections for detachably interconnecting said pumps of the stacked modules and the passages thereof for jointly feeding said modules with oxygen containing gas and with said thermal fluid and for removing gas and said thermal fluid from the stack, whereby individual modules of said stack are removable therefrom and replaceable thereon; and

a motor mounted on said stack for driving said pumps through the plug connections interconnecting said pumps.

5,010,015

RECOMBINANT DNA-MOLECULES AND METHOD FOR PROTEIN PRODUCTION

Ilkka Palva, Helsinki, Finland, assignor to Genesit Oy and Oy Alko AB, both of Helsinki, Finland

Continuation of Ser. No. 939,244, Dec. 5, 1986, abandoned, which is a continuation of Ser. No. 336,405, Dec. 31, 1981, abandoned. This application Nov. 30, 1987, Ser. No. 129,357

Claims priority, application France, Dec. 31, 1980, 804081

Int. Cl.[5] C12P *21/00;* **C12N** *15/00, 1/20, 9/86*

U.S. Cl. 435—320 **6 Claims**

1. A recombinant DNA molecule comprising a plasmid which is capable of multiplying in Bacillus strain bacteria, the regulation and secretion signal sequences of the α-amylase gene of *B. amyloliquefaciens*, and the DNA sequence encoding the amino acids of a desired protein or polypeptide, said DNA sequence being downstream of said secretion signal sequence, with the proviso that said desired protein is not α-amylase of *B. amyloliquefaciens*.

5,010,016

METHOD AND TEST KIT FOR THE DETERMINATION OF FETAL PULMONARY MATURITY STATUS

Anthony J. Sbarra, 54 Cypress Rd., Milton, Mass. 02186

Filed Aug. 9, 1989, Ser. No. 391,411

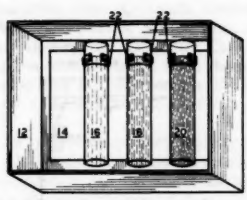
Int. Cl.[5] B01L *3/14;* **G01N** *21/76, 33/48, 33/92*

U.S. Cl. 436—63 **12 Claims**

1. A method for the determination of fetal pulmonary maturity from an amniotic fluid test sample, which method comprises:

visually comparing a pigment-free amniotic fluid test sample from a patient to a positive control sample which mimics an optical density (OD) of about 0.80 at 650 nm which indicates fetal pulmonary maturity and a negative control

sample which mimics an optical density (OD) of about 0.50 at 650 nm which indicates fetal pulmonary immaturity and from said comparing providing an indication of the fetal pulmonary status of the fetus.

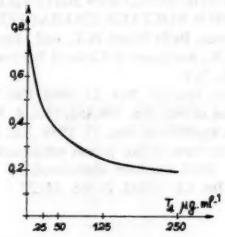


5,010,017

PROCESS FOR THE IMMUNOLOGICAL QUANTITATIVE DETERMINATION OF T_3 AND/OR T_4 THYROID HORMONES, USING THYROGLOBULIN

Bernard Ferrua, Nice, and Claude Moulin, Bagnols sur Ceze, both of France, assignors to Compagnie Oris Industrie S.A., France

Division of Ser. No. 48,060, May 11, 1989, Pat. No. 4,966,838. This application Aug. 17, 1990, Ser. No. 569,396
Claims priority, application France, May 12, 1986, 86 06763
Int. Cl.[5] G01N *33/53*; C12Q *1/00*
U.S. Cl. 436—500 **5 Claims**



1. A kit for the quantitative determination of T_4 thyroxine, which comprises:

a series of tubes each comprising a solid phase coated under the same conditions with thyroglobulin, wherein thyroglobulin is first fixed on a solid support,

a series of flasks containing standard samples of thyroxine, and

a flask containing a labelled anti-T_4 antibody.

5,010,018

METHOD FOR FORMING SCHOTTKY PHOTODIODES

Kenneth J. Polasko, Latham, and Ivan L. Wemple, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 369,405, Jun. 21, 1989, Pat. No. 4,982,246. This application Sep. 24, 1990, Ser. No. 586,920
Int. Cl.[5] H01L *31/376*
U.S. Cl. 437—3 **11 Claims**

1. A method for fabricating a Schottky photodiode, comprising the steps of:

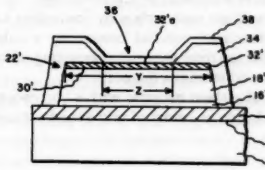
(a) depositing a first layer of conductive material on a principal substrate surface to form a base electrode;

(b) depositing a first layer of semiconductor material having a selected conductivity on the base electrode;

(c) depositing at leest a second layer of semiconductor material on the first semiconductor layer;

(d) depositing at least a second layer of conductive material on the second semiconductor layer;

(e) selectively patterning the second conductive layer and the first and second semiconductor layers with the same mask to form each of at least one Schottky photodiode island; and



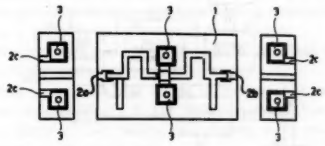
(f) providing another electrode contacting the second conductive layer.

5,010,019

METHOD OF MAKING A SEMICONDUCTOR DEVICE OPERATING IN HIGH FREQUENCY RANGE

Takayuki Katoh, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 426,926, Oct. 26, 1989, which is a division of Ser. No. 81,709, Aug. 3, 1987, Pat. No. 4,926,234. This application Apr. 24, 1990, Ser. No. 513,642
Claims priority, application Japan, Aug. 6, 1986, 61-185715
Int. Cl.[5] H01L *21/60, 21/66*
U.S. Cl. 437—8 **8 Claims**



1. A method of manufacturing a semiconductor device operating in a high frequency range, said method comprising:

a step of preparing a semiconductor substrate (1) having a major surface and including integrated circuits;

a step of forming an input electrode pad (2*a*) on said major surface of said semiconductor substrate (1) to be connected with said integrated circuits;

a step of forming an output electrode pad (2*b*) on said major surface of said semiconductor substrate (1) to be connected with said integrated circuits;

a step of forming grounding electrode pads (2*c*) on said major surface of said semiconductor substrate (1) for grounding said semiconductor substrate (1) in a high frequency characteristic test; and

a step of removing parts of said semiconductor substrate (1) including parts of said input electrode pad (2*a*) and said output electrode pad (2*b*) and said grounding electrode pads (2*c*) after said high frequency characteristic test.

5,010,020

QUICK COLOR TEST TO DETECT LEAD RELEASE FROM GLAZE AND ENAMEL COATINGS

John H. Gould, Silver Spring, Md., assignor to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Continuation-in-part of Ser. No. 264,041, Oct. 28, 1988, Pat. No. 4,873,197. This application Oct. 6, 1989, Ser. No. 418,283
Int. Cl.[5] G01N *31/22*
U.S. Cl. 436—77 **22 Claims**

1. A kit for detecting the presence of excessive lead in a glaze or enamel coating, the kit comprising:

precut pieces of an absorbent paper;

an aqueous solution of a suitable acid;

distilled or deionized water; and

a chromogen which visibly changes colors when excessive lead is present in said coating.

7. A method for determining the presence of excessive amounts of lead in a surface, which comprises:

extracting lead from said surface by contacting said surface with an absorbent material containing a solution of a material selected from the group consisting of formic acid, citric acid, and mixtures thereof;

spotting said absorbent material with a chromogen; and

detecting a change in colors of said absorbent material.

5,010,021

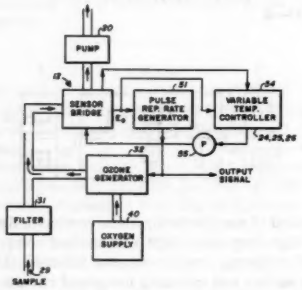
METHOD FOR RESTORING THE SENSING CAPACITY OF AN ELECTRICAL SENSOR

William E. Bell, and John J. McNerney, both of Jerome, Ariz., assignors to Arizona Instrument Corp., Tempe, Ariz.

Division of Ser. No. 735,484, May 20, 1985, Pat. No. 4,724,008, which is a continuation-in-part of Ser. No. 529,578, Sep. 6, 1983, abandoned. This application Jan. 21, 1988, Ser. No. 146,419

Int. Cl.[5] G01N *27/08*

U.S. Cl. 436—120 **4 Claims**



1. A method of detecting the presence of a reduced sulfur compound component in a fluid mixture which comprises selectively adsorbing the reduced sulfur compound from the mixture onto a thin layer of a metal having a chemical affinity for the sulfur component;

detecting the resistance of the layer consequent to the adsorption for detecting the presence of the selected sulfur component; and

oxidizing and evolving the sulfur component from the metal having the chemical affinity for the sulfur component in the presence of ozone to maintain the sensitivity of the metal to the adsorbed component.

5,010,022

METHOD FOR DETERMINING SULFUR LOADING IN ORGANIC POLYSULFIDES

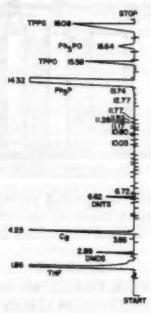
Michael J. Lindstrom, Downingtown, Pa., assignor to Atochem North America, Inc., Philadelphia, Pa.

Filed Nov. 2, 1989, Ser. No. 430,757

Int. Cl.[5] C01N *30/00*

U.S. Cl. 436—123 **16 Claims**

14. A method for determining the amount of sulfur contained in a dimethylpolysulfide composition having more than 5 sulfur atoms, comprising combining the dimethylpolysulfide composition with a treating solution comprising triphenylphosphine, tetrahydrofuran, octane and triphenylphosphate; allowing the combination to stand for a period of time sufficient to allow the dimethylpolysulfide and the triphenylphosphine to react; and analyzing the combination by gas chromatography.



5,010,023

METHOD FOR FABRICATING A RECTIFYING SEMICONDUCTOR JUNCTION HAVING IMPROVED BREAKDOWN VOLTAGE CHARACTERISTICS

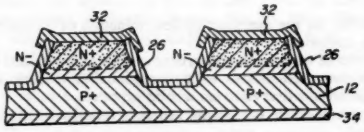
Willem G. Einthoven, Belle Mead, N.J., and Muni M. Mitchell, Huntington, N.Y., assignors to General Instrument Corporation, New York, N.Y.

Division of Ser. No. 142,737, Nov. 11, 1988, Pat. No. 4,891,685, which is a division of Ser. No. 784,451, Oct. 4, 1985, Pat. No. 4,740,477. This application Sep. 27, 1989, Ser. No. 404,604

The portion of the term of this patent subsequent to Apr. 26, 2005, has been disclaimed.

Int. Cl.[5] H01L *21/66, 21/22*

U.S. Cl. 437—8 **12 Claims**



1. A method for fabricating a rectifying semiconductor junction having improved breakdown voltage characteristics comprising the steps of:

forming a mesa shape in at least one layer of a rectifying semiconductor junction with the top of the mesa at the top surface of said layer and the side wall of the mesa sloping outwardly from the top of the mesa toward said junction;

forming a high concentration semiconductor region in the top surface of said layer, said region having the same conductivity type as said layer and covering an area sufficient to extend entirely across the top of said mesa to intersect the mesa side wall; and

driving said high concentration region from the top of said mesa deeper into said layer but not beyond the base of said mesa, relying on the outward slope of the mesa geometry to cause the high concentration region to take on a generally concave shape as it penetrates into the mesa, with the distance between the high concentration region and the junction being greater at the intersection of said region with the sloping walls of the mesa than in the central portion of said mesa.

5,010,024

PASSIVATION FOR INTEGRATED CIRCUIT STRUCTURES

Bert L. Allen, Los Altos; Peter S. Gwozdz, Cupertino, both of Calif., and Thomas R. Bowers, Austin, Tex., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Division of Ser. No. 21,828, Mar. 4, 1987, abandoned. This application May 15, 1989, Ser. No. 353,169

Int. Cl.[5] H01L *21/425, 21/441*

U.S. Cl. 437—24 30 Claims

1. A method for producing an integrated circuit structure encapsulated in a layer of silicon nitride to provide resistance to penetration by moisture and ion contaminants and further characterized by a substantial absence of observable voids in an underlying metal layer which comprises a portion of said integrated circuit structure, said method comprising the step of: stress relieving the underlying metal layer from stresses induced by the compressive stress of said silicon nitride encapsulating layer by implanting the metal surface of said metal layer, before encapsulating said structure with said silicon nitride layer, with ions to change the grain structure adjacent the surface of said metal layer.

5,010,025

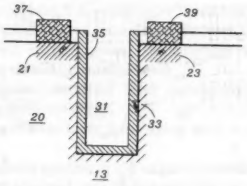
METHOD OF MAKING TRENCH JFET INTEGRATED CIRCUIT ELEMENTS

Allen L. Solomon, Fullerton, Calif., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Apr. 3, 1989, Ser. No. 331,952

Int. Cl.[5] H01L *21/265*

U.S. Cl. 437—29 14 Claims



1. A method of forming a trench gate JFET comprising:

forming a first trench in a semiconductor substrate of a first conductivity type;

forming a region of a semiconductor material of a second conductivity type within the substrate adjacent to the first trench;

forming a layer of semiconductor material of a first conductivity type within the first trench upon the surface of said semiconductor material of the second conductivity type, said layer of semiconductor material of the first conductivity type interfacing with said region of semiconductor material of the second conductivity type to form a p-n junction; and

forming source and drain regions within said substrate adjacent to said first trench, said gate and source regions being in contact with said region of semiconductor material of a second conductivity type.

5,010,026

PROCESS FOR MAKING BIPOLAR TRANSISTOR

Takayuki Gomi, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Aug. 10, 1989, Ser. No. 391,880

Claims priority, application Japan, Aug. 12, 1988, 63-201360

Int. Cl.[5] H01L *21/331*

U.S. Cl. 437—31 3 Claims

1. A process for fabricating a bipolar transistor comprising;

providing a semiconductor substrate of a first conductivity type,

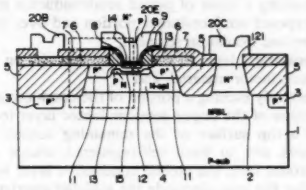
forming an epitaxial layer on the surface said semiconductor substrate,

selectively oxidizing said epitaxial layer to form a field oxide layer surrounding a device forming region two-dimensionally,

forming a device forming region surrounded two-dimensionally by said field oxide film,

forming a base contact electrode layer confronted by said device forming region, said base contact electrode layer containing impurities and covered by an insulating layer,

opening said base contact electrode layer covered by said



insulating film to form an opening in said device forming region,

introducing impurities forming a linking base region and a diffusion suppressing region into said device forming region via said opening to a predetermined depth,

diffusing impurities from said base contact electrode layer by heat treatment to form a graft base region,

forming sidewall spacers on the side walls of said opening in said base contact electrode layer,

forming an intrinsic base region in contact with said linking base region and to a deeper diffusion depth than the diffusion depth of said linking base region, using said sidewall spacers as the mask, and

forming an emitter region in said intrinsic base region.

5,010,027

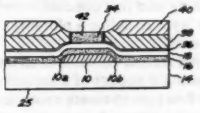
METHOD FOR FABRICATING A SELF-ALIGNED THIN-FILM TRANSISTOR UTILIZING PLANARIZATION AND BACK-SIDE PHOTORESIST EXPOSURE

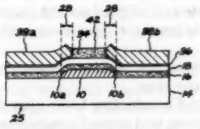
George E. Possin, and Wei Ching-Yeu, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 21, 1990, Ser. No. 499,733

Int. Cl.[5] H01L *29/78, 21/00*

U.S. Cl. 437—41 23 Claims





1. A method for fabricating a thin-film transistor, comprising the steps of:

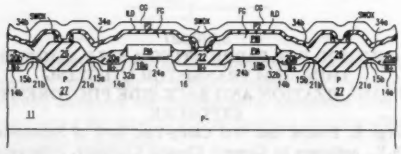
(a) forming an opaque gate electrode on a principal surface of a transparent substrate;
(b) depositing a first layer of insulation material on the principal substrate surface over the gate electrode;
(c) depositing a layer of semiconductor material on the first insulation layer;
(d) depositing a second layer of insulation material on the semiconductor layer;
(e) selectively etching the second insulation layer to leave a remaining second insulation segment and to expose a portion of the semiconductor layer not covered by the remaining second insulation segment, the remaining second insulation segment being aligned with the gate electrode and being narrower than the gate electrode by a selected overlap distance on each side thereof;
(f) depositing a layer of doped semiconductor material on the exposed semiconductor portion and over the remaining second insulation segment;
(g) depositing a layer of conductive material on the doped semiconductor material; and
(h) selectively etching a portion of the conductive layer and a portion of the doped semiconductor layer to expose at least a top surface of the remaining second insulation segment and to form self-registered source and drain electrodes from the etched conductive layer which each overlap the gate electrode the selected overlap distance, said source and drain electrodes each terminating at said second insulation segment without overlap thereof.

5,010,028

METHOD OF MAKING HOT ELECTRON PROGRAMMABLE, TUNNEL ELECTRON ERASABLE CONTACTLESS EEPROM

Manzur Gill, Rosharon, and Sung-Wei Lin, Houston, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 29, 1989, Ser. No. 458,936
Int. Cl.[5] H01L *21/265*
U.S. Cl. 437—43 **10 Claims**



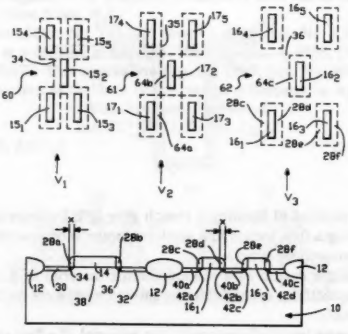
1. A method of fabricating an electrically erasable, electrically programmable read-only memory cell at the face of a semiconductor substrate of a first conductivity type, comprising the steps:
forming a first conductive layer and an underlying channel insulator layer over the face of the substrate;
selectively etching said first conductive layer and said channel insulator layer to define a plurality of parallel channel section columns;
using the channel section columns as an implant mask, selectively implanting a dopant of a second conductivity type opposite the first type to create a source and a drain bitline along respective sides of each channel section column, with respective source/drain bitline junctions substantially aligned with corresponding edges of a channel section column said source bitlines including tunnel window areas opposite said aligned source junction;
forming a thick insulator layer over said source and drain bitlines;
forming a thin tunnel window insulator layer over each tunnel window area;
forming a second conductive layer over the substrate face;
selectively etching said second conductive layer to define a plurality of parallel floating gate columns extending over said channel section column, said source bitline thick insulator layer and said tunnel window insulator layer, thereby defining floating gate conductors in the wordline row direction;
forming a thin interlevel insulator layer and a third conductive layer over the face of the substrate; and
stack etching said second and third conductive layers, and said interlevel insulator layer, to define parallel wordline rows, with each wordline row defining a row of memory cells;
such that each memory cell in a wordline row includes a control gate conductor formed by a corresponding portion of said third conductive layer, source and drain regions formed by corresponding portions of said source and drain bitlines underlying said control gate conductor, a tunnel window subregion formed by a corresponding portion of said tunnel window area underlying said control gate conductor, a floating gate conductor with a channel section formed by a corresponding portion of said channel section column and a tunnel window section formed by a corresponding portion of said second conductive layer overlying said tunnel window subregion.

5,010,029

METHOD OF DETECTING THE WIDTH OF SPACERS AND LIGHTLY DOPED DRAIN REGIONS

Yow-Juang (Bill) Liu, San Jose, and Zahra Hadjizadeh-Amini, Cupertino, both of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Feb. 22, 1989, Ser. No. 313,984
Int. Cl.[5] H01L *21/66*
U.S. Cl. 437—44 **11 Claims**



1. A process of fabricating, in a substrate, a field effect transistor having lightly-doped drain regions of a selected width, comprises the steps of:
(a) forming reference structures, separated by a known distance, overlying the substrate and forming a gate structure overlying the substrate;
(b) forming lightly-doped drain regions self-aligned with the ends of the gate structure in the substrate;
(c) forming a layer of spacer material overlying the substrate, the reference structures and the gate structure;
(d) etching the layer of spacer material to form spacers extending laterally from the ends of the gate structure and from the reference structures;
(e) determining when the spacers have the selected width by detecting when the spacer extending from each reference structure has a width approximately equal to approximately one-half of the distance between the reference structures; and
(f) forming source and drain regions self-aligned with the

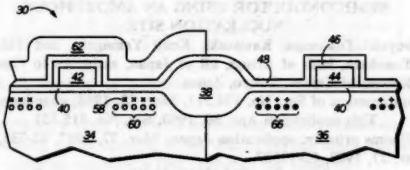
spacers in selected portions of the lightly-doped drain regions.

5,010,030

SEMICONDUCTOR PROCESS USING SELECTIVE DEPOSITION

James R. Pfiester, and James D. Hayden, both of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 30, 1989, Ser. No. 428,721
Int. Cl.[5] H01L *21/265*
U.S. Cl. 437—192 **3 Claims**



1. A process for fabricating semiconductor devices comprising the steps of:

providing a semiconductor substrate having first and second surface areas of first and second conductivity type and having an insulator layer formed thereover;

forming first and second gate electrodes overlaying said first and second surface areas, respectively, and separated therefrom by said insulator layer;

forming a second insulator layer overlaying said first and second gate electrodes;

depositing a silicon layer overlaying said second insulator layer;

forming sidewall spacers at the edges of said first and second gate electrodes and overlaying said silicon surface;

forming a third insulator layer overlaying exposed portions of said silicon layer;

forming a mask overlaying said second surface region and exposing a portion of said third insulator overlaying said first surface region;

implanting ions of said second conductivity type into said first surface region using said first gate electrode, sidewall spacers, and mask as an implantation mask;

removing said sidewall spacers and said third insulator layer overlaying said first region;

implanting additional ions of said second conductivity type into said first surface region using said first gate electrode and said mask as an implantation mask;

removing said mask;

depositing a second masking material by selective deposition onto portions of said silicon layer not overlaid by said third insulator layer;

implanting ions of said first conductivity type into said second surface region using said sidewall spacers, said second gate electrode and said second masking material as implantation masks;

removing said third insulator and said sidewall spacers;

implanting additional ions of said second conductivity type into said second surface region using said second gate electrode and said second masking material as an etch mask; removing said masking material; and

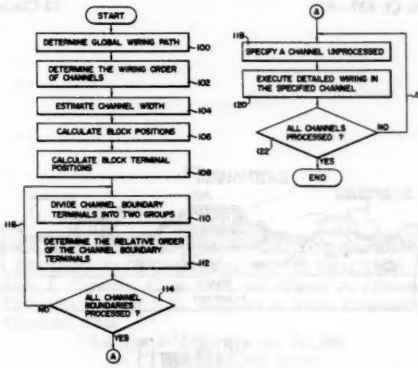
removing said silicon layer.

5,010,031

AUTOMATIC WIRING METHOD FOR SEMICONDUCTOR INTEGRATED CIRCUIT DEVICES

Fumihiro Minami, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 29, 1989, Ser. No. 372,907
Claims priority, application Japan, Jun. 30, 1988, 63-160782
Int. Cl.[5] H01L *21/70*
U.S. Cl. 437—51 **9 Claims**



1. An automatic wiring method for a semiconductor integrated circuit device wherein function blocks selected to provide a desired logical function are arranged on a substrate, and channels are defined as a wiring region around the function blocks, said method comprising the steps of:

(a) providing tentative wirings between said function blocks in accordance with a connection requirement in said channels;

(b) detecting crossing points of corresponding wirings in each of boundary lines of said channels, the detected crossing points being defined as channel boundary terminals;

(c) specifying from said channels a certain pair of two neighboring channels which are coupled with each other so as to form a T-shaped crossing region, said two neighboring channels consisting of a first channel which is positioned between at least two corresponding function blocks and a second channel which is in contact at a boundary line with said first channel substantially at right angle thereby to form said T-shaped crossing region, said second channel extending in parallel with said channel boundary line;

(d) selecting channel boundary terminals belonging to first and second terminal groups from said channel boundary terminals defined on said boundary line, said first terminal group including terminals connected with wirings which tend to run along a first direction in said second channel, said second terminal group including terminals connected with wirings which tend to run along a second direction opposite to said first direction in said second channel;

(e) sequentially selecting channel boundary terminals from said first and second groups, respectively, to obtain a pair of channel boundary terminals; and

(f) assigning tracks to wirings associated with pairs of selected channel boundary terminals in said second channel in such a manner that each of said tracks is basically occupied with two wirings running thereon in the opposite directions to each other.

5,010,032

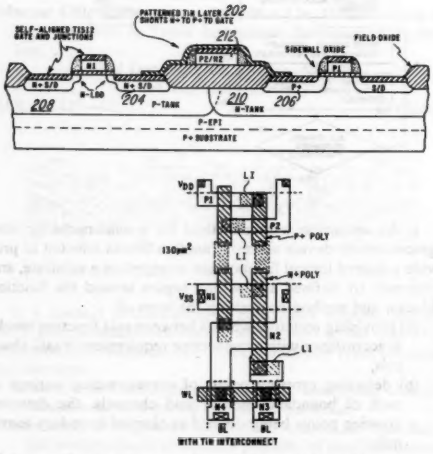
PROCESS FOR MAKING CMOS DEVICE WITH BOTH P+ AND N+ GATES INCLUDING REFRACTORY METAL SILICIDE AND NITRIDE INTERCONNECTS

Thomas E. Tang, Dallas; Che-Chia Wei, Plano; Roger A. Haken, Richardson, and Richard A. Chapman, Dallas, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 214,912, Jun. 29, 1988, Pat. No. 4,890,141, which is a continuation of Ser. No. 83,933, Aug. 5, 1987, abandoned, which is a continuation of Ser. No. 837,431, Mar. 7, 1986, abandoned, which is a continuation of Ser. No. 729,318, May 1, 1985, Pat. No. 4,821,085. This application Oct. 5, 1989, Ser. No. 417,386

Int. Cl.[5] H01L *21/336*

U.S. Cl. 437—57 **22 Claims**



11. A method for fabricating an integrated circuit at a silicon surface of a semiconductor body, comprising the steps of:

forming a device isolation structure at said surface to define first and second moat regions at said surface adjacent to said device isolation structure, said first moat region of a first conductivity type and said second moat region of a second conductivity type;

forming a first gate electrode comprising silicon doped to said second conductivity type overlying said first moat region, and a second gate electrode comprising silicon doped to said first conductivity type over said second moat region;

forming source and drain regions at the surface of said first and second moat regions adjacent said first and second gate electrodes, said source and drain regions in said first moat region of said second conductivity type, and said source and drain regions in said second moat region of said first conductivity type;

depositing a refractory metal over said moat region and said device isolation structure;

heating said body and said refractory metal in a nitrogen-bearing atmosphere, so that first regions of said refractory metal react with silicon of said gate electrodes to form refractory metal silicide thereat, and so that a second region of said refractory metal reacts to form a diffusion resistant refractory metal nitride; and

removing selected portions of the refractory metal nitride so that a remaining portion thereof provides an interconnection overlapping said device isolation structure, and in contact with said silicide at said first and second gate electrodes.

5,010,033

PROCESS FOR PRODUCING COMPOUND SEMICONDUCTOR USING AN AMORPHOUS NUCLEATION SITE

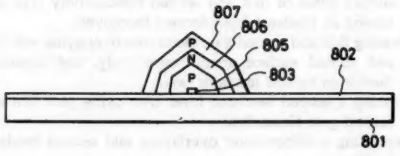
Hiroyuki Tokunaga, Kawasaki; Kenji Yamagata, and Takao Yonehara, both of Atsugi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 174,511, Mar. 28, 1988, abandoned. This application Apr. 30, 1990, Ser. No. 515,351

Claims priority, application Japan, Mar. 27, 1987, 62-73522; Mar. 27, 1987, 62-73523

Int. Cl.[5] H01L *21/20*

U.S. Cl. 437—83 **15 Claims**



1. A process for producing a compound semiconductor, which comprises applying a crystal forming treatment on a substrate having a free surface comprising a non-nucleation surface (S_{NDS}) with a smaller nucleation density and an amorphous nucleation surface (S_{NDL}) arranged adjacent thereto having a sufficiently small area so as to form a single nucleus from which a single crystal is grown and a larger nucleation density (ND_L) than the nucleation density (ND_S) of said non-nucleation surface (S_{NDS}) so as to form only a single nucleus from which a single crystal is grown, by exposing the substrate to either of the gas phases:

(a) gas phase (a) containing a starting material (II) for feeding the group II atoms of the periodic table and a starting material (VI) for feeding the group VI atoms of the periodic table; and

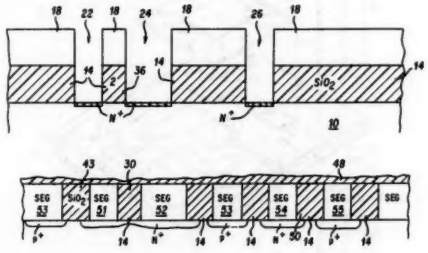
(b) gas phase (b) containing a starting material (III) for feeding the group III atoms of the periodic table and a starting material (V) for feeding the group V atoms of the periodic table, thereby forming a single nucleus on said nucleation surface (S_{NDL}) and permitting a monocrystal of the compound semiconductor to grow only from said single nucleus, characterized in that a semiconductor junction is formed in said monocrystal by feeding a starting material (Dn) for feeding a dopant for controlling to a first electroconduction type and a starting material (Dp) for feeding a dopant for controlling to a second electroconduction type opposite to said first electroconduction type with change-over to one another into said gas phase, during said crystal forming treatment.

5,010,034

CMOS AND BIPOLAR FABRICATION PROCESS USING SELECTIVE EPITAXIAL GROWTH SCALABLE TO BELOW 0.5 MICRON

Juliana Manoliu, Palo Alto, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Mar. 7, 1989, Ser. No. 320,011
Int. Cl.[5] H01L 21/20
U.S. Cl. 437—89 30 Claims



1. A method of constructing a semiconductor structure comprising the steps of:

growing a layer of silicon dioxide on a silicon substrate;

etching a first opening in the silicon dioxide layer, the first opening exposing a first region of the substrate;

etching a second opening in the silicon dioxide layer in close proximity to the first opening and separated therefrom by a first wall, the second opening exposing a second region of the substrate:

implanting a first conductivity type impurity into the first and second regions of the substrate:

growing an epitaxial layer over the first and second regions of the substrate for forming corresponding first and second epitaxial regions; and

heating the substrate for causing the first conductivity type impurity in the first and second regions of the substrate to join beneath the first wall.

5,010,035

WAFER BASE FOR SILICON CARBIDE SEMICONDUCTOR DEVICE

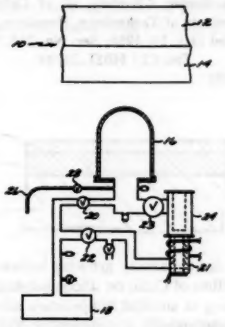
Rointan F. Bunshah, Playa Del Rey; James D. Parsons, Newbury Park, and Oscar M. Stafsudd, Los Angeles, all of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Division of Ser. No. 737,367, May 23, 1985, Pat. No. 4,767,666.
This application May 13, 1988, Ser. No. 197,582
Int. Cl.[5] H01L 21/20
U.S. Cl. 437—100 8 Claims

1. A process for preparing a semiconductor device wafer base, comprising the steps of:

furnishing a single crystal titanium carbide substrate; and

depositing an overlay layer of beta silicon carbide onto said substrate, said overlay layer being a single crystal, epitaxially related to said substrate, unpolytyped, uncracked,



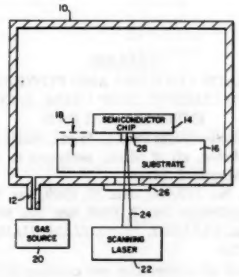
without twins, and of integrated circuit quality surface morphology.

5,010,036

LOW TEMPERATURE SEMICONDUCTOR BONDING PROCESS WITH CHEMICAL VAPOR REACTION

Joseph A. Calviello, Kings Park, and Grayce A. Hickman, Hicksville, both of N.Y., assignors to Eaton Corporation, Cleveland, Ohio

Filed Apr. 20, 1990, Ser. No. 511,588
Int. Cl.[5] H01L 21/268, 21/58
U.S. Cl. 437—173 10 Claims



1. A method for bonding a semiconductor chip to a substrate, comprising:

providing a semiconductor chip;

providing a substrate;

separating said chip and said substrate by a gap;

introducing a metal-bearing gas in said gap;

providing a thermal energy source having a focused energy beam;

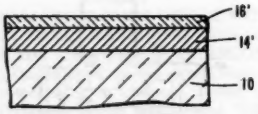
directing said beam into said gap to thermally decompose said gas by chemical vapor reaction to deposit and grow metal to provide a metallic molecular bond interface filling said gap and bonding said chip to said substrate.

5,010,037

PINHOLE-FREE GROWTH OF EPITAXIAL COSI$_2$ FILM ON SI(111)

True-Lon Lin, Cerritos; Robert W. Fathauer, Sunland, and Paula J. Grunthaner, Glendale, all of Calif., assignors to California Institute of Technology, Pasadena, Calif.

Filed Oct. 14, 1988, Ser. No. 257,758
Int. Cl.^{5} H01L *21/44*
U.S. Cl. 437—200 **14 Claims**



1. A process for epitaxially growing substantially pinhole-free crystalline films of $CoSi_2$ on silicon substrates comprising:

(a) codepositing at ambient temperature silicon and cobalt atoms in substantially stoichiometric ratio on a major surface of said substrate to form an amorphous film of Co/Si in a 1:2 mixture;

(b) depositing at ambient temperature a layer of amorphous silicon on said amorphous film to form a composite structure; and

(c) annealing said composite structure at a temperature ranging from about 500° to 750° C. to form said crystalline film of $CoSi_2$ capped with crystalline silicon.

5,010,038

METHOD OF COOLING AND POWERING AN INTEGRATED CIRCUIT CHIP USING A COMPLIANT INTERPOSING PAD

Leslie R. Fox, Boxborough; Paul C. Wade, Shirley, and William L. Schmidt, Acton, all of Mass., assignors to Digital Equipment Corp., Maynard, Mass.

Division of Ser. No. 373,960, Jun. 29, 1989, Pat. No. 4,954,878. This application Jul. 9, 1990, Ser. No. 549,611
Int. Cl.^{5} H01L *21/60, 21/54, 21/58*
U.S. Cl. 437—215 **10 Claims**

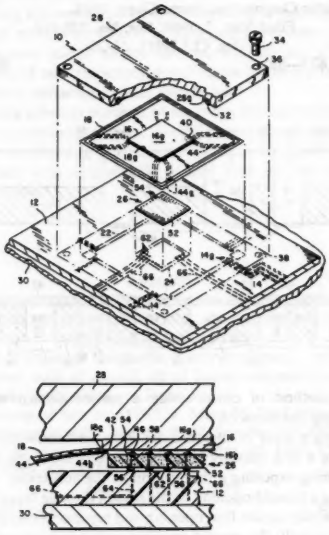
1. The method of connecting and cooling an IC chip comprising the steps of:

forming a compliant pad with an array of electrical conductors embedded in said pad with the opposite ends of the conductors being exposed at opposite faces of the pad;

sandwiching the compliant pad between a chip and a substrate so that the exposed ends of the pad conductors engage exposed contacts on opposing faces of the chip and substrate, respectively;

engaging the opposite face of the chip with a thermal transfer member; and

bringing the thermal transfer member and substrate together so as to compress the pad thereby simultaneously establishing relatively low inductance electrical connections between the contacts on the chip and the contacts on the



substrate and good thermal contact between the chip and the thermal transfer member.

5,010,039

METHOD OF FORMING CONTACTS TO A SEMICONDUCTOR DEVICE

San-Mei Ku, 3 Carnelli Ct., Poughkeepsie, N.Y. 12603, and Kathleen A. Perry, 22120 Viscanio Rd., Woodland Hills, Calif. 91364

Filed May 15, 1989, Ser. No. 351,993
Int. Cl.^{5} H01L *21/47*
U.S. Cl. 437—228 **8 Claims**

1. A method of forming electrical connections to a base contact, an emitter contact, and a subcollector reachthrough region of a bipolar transistor, comprising the steps of:

forming a layer of etch stop material having a first etch characteristic over said base contact, emitter contact, and subcollector reachthrough region;

forming a layer of dielectric material having a second etch characteristic conformally over said layer of etch stop material;

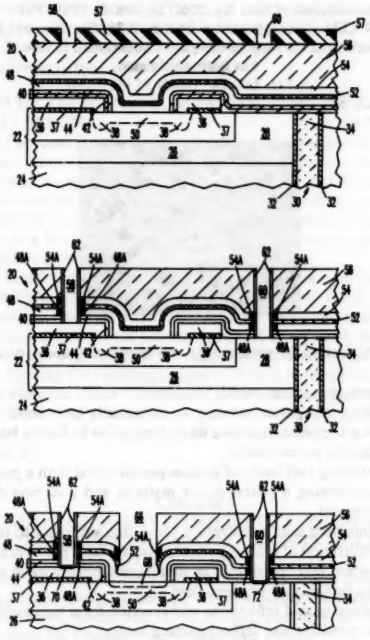
simultaneously etching base contact and subcollector reachthrough vias through said layer of dielectric material using an etchant selective to said dielectric material so as to stop on said layer of etch stop material over said base contact and said subcollector reachthrough region;

extending said base contact and subcollector reachthrough vias through said layer of etch sto material so as to expose the surfaces of said base contact and said subcollector reachthrough region;

forming a mask over said base contact and subcollector reachthrough vias;

etching an emitter contact via through said layer of dielectric material using an etchant selective to said dielectric

material so as to stop on said layer of etch stop material over said emitter contact;



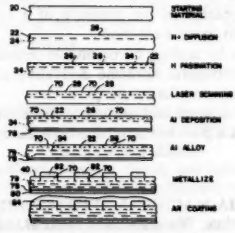
extending said emitter contact via through said layer of etch stop material to the surface of said emitter contact; and removing said mask.

5,010,040

METHOD OF FABRICATING SOLAR CELLS

Zinovy Y. Vayman, Brookline, Mass., assignor to Mobil Solar Energy Corporation, Billerica, Mass.

Filed Dec. 30, 1988, Ser. No. 292,492
Int. Cl.[5] H01L *21/02*
U.S. Cl. 437—230 **14 Claims**



1. A method of forming metallization patterns on a silicon substrate that is to be used to form a photovoltaic cell comprising in sequence the steps of:

(a) exposing a first surface of said substrate to a hydrogen ion beam of an intensity and for a duration sufficient to hydrogen passivate the substrate and form a damaged surface layer to which metals deposited by immersion plating will only poorly adhere; and

(b) scanning selected portions of said first surface with a laser beam of an intensity and for a duration sufficient to anneal selected portions of said damaged layer so as to create a metallization pattern consisting of non-passivated areas of said first surface to which selected metals will securely adhere, said metallization pattern being created in an environment substantially free of chemical etching substances.

5,010,041

COLORED LOW-EXPANSION TRANSPARENT GLASS CERAMIC

Akihiro Koyama; Keiji Kitamura, and Nobuyuki Yamamoto, all of Osaka, Japan, assignors to Nippon Sheet Glass Co., Ltd., Osaka, Japan

Filed Aug. 8, 1989, Ser. No. 390,771
Claims priority, application Japan, Aug. 17, 1988, 63-204164
Int. Cl.[5] C03C *10/12, 10/14, 3/11*
U.S. Cl. 501—4 **10 Claims**

1. A colored low-expansion transparent glass ceramic comprising 100 parts by weight of a base glass (a) formed of following weight% of components, following part by weight of coloring components (b) and 0.0002 to 0.7 part by weight of following auxiliary coloring components (c) mixed thereto, said glass ceramic having a β-quartz solid solution as the principal crystalline phase, coefficient of linear expansion of -10×10^{-7} to 10×10^{-7} (K^{-1}) in a temperature range of 100° to 800° C. and excitation purity between 1.3 and 11.3%:

(a) Base glass

	([part by] weight %)
Li_2O	3.5 to 5.5
Na_2O	0 to 4.0
K_2O	0 to 4.0
$Na_2O + K_2O$	0.5 to 4.0
MgO	0.1 to 3.0
Al_2O_3	20.5 to 23.0
SiO_2	60.0 to 68.5
TiO_2	1.0 to 7.0
ZrO_2	0 to 3.5
$TiO_2 + ZrO_2$	3.5 to 7.0
P_2O_5	0 to 4.0

(b) Coloring components

	(part by weight)
CoO	0 to 0.02
Cr_2O_3	0 to 0.05
MoO_3	0 to 0.04
NiO	0 to 0.075

(c) Auxiliary coloring components at least one member selected from the group consisting of

	(part by weight)
Cl	0 to 0.6
Br	0 to 0.4, and
I	0 to 0.03

5,010,042

SINTERED GLASS BODY WITH OPAQUELY MOTTLED PATTERN AND METHOD OF PRODUCING SAME

Takayoshi Kandachi, Osaka, Japan, assignor to Central Glass Company, Limited, Ube, Japan

Filed Dec. 23, 1988, Ser. No. 288,965
Claims priority, application Japan, Dec. 26, 1987, 62-331335
Int. Cl.[5] C03C *1/06*
U.S. Cl. 501—32 7 Claims

1. A method of producing a substantially foamless sintered glass body with an opaquely mottled pattern, the method comprising the steps of:

(a) preparing a mixture of 100 parts by weight of a powder of a glass, selected from the group consisting essentially of alkali lime glass, boro-silicate glass and aluminosilicate glass; 0.2 to 10 parts by weight of a powder of at least one heat-resistant inorganic oxide, which is colorless or assumes a whitish color and has a refractive index different from the refractive index of said glass by at least 15%, selected from the group consisting of aluminum oxide, zirconium oxide, titanium oxide, stannic oxide, zinc oxide, zircon and spinel; and an inorganic pigment, selected from the group consisting of metals, metal oxides and other kinds of metal salts and which differs in color from the inorganic oxide;

(b) compressively granulating said mixture into granules not smaller than 1 mm in granule size;

(c) mixing said granules;

(d) firing the mixed granules at a temperature in the range from the softening point of said glass to the fluid point of said glass and applying a pressure to the fired material during or immediately after firing.

5,010,043

PRODUCTION OF DIAMOND COMPACTS CONSISTING ESSENTIALLY OF DIAMOND CRYSTALS BONDED BY SILICON CARBIDE

Alfred E. Ringwood, Redhill, Australia, assignor to The Australian National University, Australia

PCT No. PCT/AU88/00058, § 371 Date Nov. 15, 1988, § 102(e) Date Nov. 15, 1988, PCT Pub. No. WO88/07409, PCT Pub. Date Oct. 6, 1988
PCT Filed Mar. 2, 1988, Ser. No. 283,362
Claims priority, application Australia, Mar. 23, 1987, PI1024
Int. Cl.[5] C04B *35/56, 35/58;* B24D *3/00*
U.S. Cl. 501—90 19 Claims

1. A process for producing a diamond compact consisting essentially of diamond crystals bonded by silicon carbide, said process comprising the steps of:

(1) intimately mixing diamond crystals with silicon in the proportions of about 97 to 65 percent weight of diamond to about 3 to 35 percent by weight of silicon to produce an intimate mixture of the diamond crystals and silicon;

(2) confining said intimate mixture of diamond crystals and silicon in a pressure vessel together with one or more bodies of silicon in contact with or immediately adjacent to said intimate mixture within the pressure vessel; and

(3) subjecting said intimate mixture of diamond crystals and silicon and said one or more bodies of silicon within the pressure vessel to a temperature above the melting point of silicon in the range of about 1,100° to 1,800° C. and to pressure in the range of about 10 to 40 kilobars so as to cause melting of the silicon in said intimate mixture and melting of said one or more bodies of silicon and infiltration of silicon from said one or more bodies into the interstitial spaces between the diamond crystals and to cause most of the silicon between the diamond crystals to react with diamond to produce silicon carbide, said silicon carbide forming a bond between diamond crystals, the overall proportions of diamond and silicon being such as to produce a compact containing between about 50 and 85 volume percent of diamond with a density of at least 3.35 g/cm^3 and a compressive strength of at least 10 kilobars.

5,010,044

PROCESS FOR PREPARING SELF-SUPPORTING BODIES AND PRODUCTS PRODUCED THEREBY

Marc S. Newkirk, Newark, Del., assignor to Lanxide Technology Company, LP., Newark, Del.

Continuation of Ser. No. 296,773, Jan. 3, 1989, Pat. No. 4,885,131. This application Dec. 5, 1989, Ser. No. 446,321
The portion of the term of this patent subsequent to Dec. 5, 2006, has been disclaimed.
Int. Cl.[5] C04G *35/02*
U.S. Cl. 501—93 7 Claims

1. A method for producing a self-supporting body, comprising:

selecting a parent metal;

heating said parent metal in a substantially inert atmosphere to a temperature above its melting point to form a body of molten parent metal;

contacting said body of molten parent metal with a preform comprising a boron donor material and a carbon donor material;

maintaining said temperature for a time sufficient to permit infiltration of molten parent metal into said preform and to permit reaction of said molten parent metal with at least a portion of said preform; and

continuing said infiltration and reaction for a time sufficient to produce said self-supporting body.

5,010,045

LOW-LOSS BINDER FOR HOT PRESSING BORON NITRIDE

Leon Maya, Oak Ridge, Tenn., assignor to The United States of America as Represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 2, 1989, Ser. No. 360,561
Int. Cl.[5] C04B *35/58*
U.S. Cl. 501—96 15 Claims

3. A polymeric borazine derivative useful as a binder in the formation of boron nitride ceramics, consisting essentially of the product of a reaction mixture of bistrimethylsilylacetylene and a chloroborazine in the presence of a Lewis acid and sufficient heat to cause a reaction.

15. A process for making boron nitride ceramic comprising:

mixing the polymeric borazine derivative of claim 3 and boron nitride powder;

pressing said mixture and heating to drive off the volatiles, resulting in a pure boron nitride ceramic composition.

5,010,046

CHROMIA-MAGNESIA REFRACTORY BODY

Anthony K. Butkus, Worcester, and Scott D. Martin, Paxton, both of Mass., assignors to Norton Company, Worcester, Mass.

Continuation-in-part of Ser. No. 327,061, Mar. 22, 1989, abandoned. This application Mar. 5, 1990, Ser. No. 488,162
Int. Cl.[5] C04B *35/04, 35/10, 35/12*
U.S. Cl. 501—117 20 Claims

1. In a refractory product consisting essentially of grains of co-fused chromia and magnesia bonded with an in situ formed microcrystalline bond of chromia, the improvement consisting

essentially of the substantial absence of said grains which can pass though a sieve opening of 150 microns.

5,010,047

RECOVERY OF DOUBLE METAL CYANIDE COMPLEX CATALYST FROM A POLYMER

Jonathan L. Schuchardt, Exton, Pa., assignor to Arco Chemical Technology, Inc., Wilmington, Del.

Filed Feb. 27, 1989, Ser. No. 315,662

Int. Cl.[5] B01J *27/32, 38/68;* C07C *41/03, 43/11*

U.S. Cl. 502—24 16 Claims

1. A process for recovering a double metal cyanide complex catalyst from a polymer product having a number average molecular weight of from about 500 to about 20,000 and selected from the group consisting of epoxide polymers, epoxide-/anhydride copolymers, and epoxide/carbon dioxide copolymers, in a form suitable for use as a polymerization catalyst which comprises the steps of:

(a) dissolving a double metal cyanide complex catalyst-containing polymer product in an amount of a non-polar solvent having a dielectric constant lower than the dielectric constant of the polymer product effective to precipitate the double metal cyanide complex catalyst; and

(b) filtering the resulting polymer solution in the presence of a filter aid which is suspended in the solution in an amount effective to accomplish separation of the precipitated double metal cyanide complex catalyst from the polymer product.

5,010,048

CATALYST OF THE GALLOSILICATE TYPE AND ITS UTILIZATION FOR THE AROMATIZATION OF LIGHT C_2-C_4 GASES

Laurent Petit, Paris; Jean-Paul Bournonville, Cergy Pontoise; Jean-Louis Guth, Mulhouse; Francis Raatz, Acheres, and Alain Seive, Mulhouse, all of France, assignors to Institut Francais Du Petrole, Rueil-Malmaison, France

Filed Jul. 12, 1989, Ser. No. 379,469

Claims priority, application France, Jul. 12, 1988, 88 09631

Int. Cl.[5] B01J *29/04, 27/12*

U.S. Cl. 502—61 8 Claims

1. A catalyst comprising by weight:

(a) 0.01 to 99.49% of a matrix chosen from the group consisting of alumina, silica, magnesia, and a clay; and

(b) 0.51 to 99.99% of a gallosilicate zeolite synthesized in a fluorine-containing medium having an MFI structure comprising:

a fluorine content of 0.02 to 1.5% by weight,

an Si^{IV}/Ga^{III} molar ratio at least equal to 8.6, and

an X-ray diffraction diagram chosen from the group consisting of the diagram in Table 1 having a monoclinical structure and the diagram in Table 2 having an orthorhombic structure.

5,010,049

MODIFIED MOLYBDENUM SULFIDE HYDRODESULFURIZATION/HYDRODENITROGENATION CATALYSTS

Maria A. Villa-Garcia, Oviedo, Spain, and Johannes Schwank, Ann Arbor, Mich., assignors to The Regents of the University of Michigan, Ann Arbor, Mich.

Filed Mar. 24, 1989, Ser. No. 328,338

Int. Cl.[5] B01J *27/04, 27/043, 27/047*

U.S. Cl. 502—60 24 Claims

1. A composition comprising a support and a catalyst having an overall stoichiometry of $M_{2x}A_{1-x}S_2$ wherein $0.001 \leqq x \leqq 0.5$, and wherein M is at least one member selected from the group consisting of Co, Fe, Ni, Cu, Zn, Mn and Ru, and A is either Mo or W, wherein said catalyst is obtained by (i) mixing elemental M, elemental A and elemental S, in a relative amount of x moles of M and (1-x)/2 moles of A per mole of S, and (ii) heating the mixture, in the absence of oxygen, to a temperature of from 200° C. to 800° C.

5,010,050

PROCESS OF PRODUCING COMPOSITE MATERIAL CONSISTING OF SHEET METAL PLATES, METAL STRIPS AND FOILS HAVING A SKELETON SURFACE STRUCTURE AND USE OF THE COMPOSITE MATERIALS

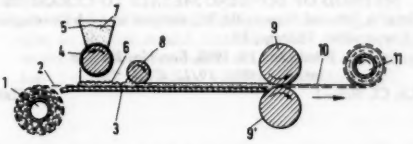
Heinz Wüllenweber, Frankfurt am Main; Peter Kohl, Neuberg; Herbert Jung, Oberursel, all of Fed. Rep. of Germany; Jürgen Borchardt, Troistorrents, Switzerland; Wolfgang Bickle, Reilingen, and Jürgen Braus, Walldorf, both of Fed. Rep. of Germany, assignors to Metallgesellschaft AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 18, 1989, Ser. No. 339,746

Claims priority, application Fed. Rep. of Germany, Apr. 23, 1988, 3813744

Int. Cl.[5] B01J *25/00*

U.S. Cl. 502—301 14 Claims



1. In a process of producing composite materials consisting of sheet metal plates, metal strips and foils having a thickness of $\leqq 5$ mm, and having a skeleton surface structure in a thickness of 1.0 to 400 μm containing catalyst material, comprises: applying a layer of a difficulty flowable material powder which is intended to constitute the skeleton structure and consists of irregular shaped particles in a size of 0.1 to 10 μm, to a surface-forming pretreated metallic carrier layer, continuously moving the carrier layer relative to the powder being dispensed, bonding said powder to the carrier layer by a cold roll cladding by which the carrier layer is simultaneously deformed by 20 to 60%, and sintering the metal powder in a reducing atmosphere at temperatures of 600° to 1000° C. with a holding time of 10 to 45 minutes, the improvement comprising uniformly distributing and applying the powder as regards its bulk volume by moving the powder layer under a distributing roller which rotates opposite to the main direction of movement of the carrier layer and directly contacting the powder on the carrier layer with the distributing roller without deforming to effect a uniform thickness of the powder on the carrier layer before the cold roll cladding.

13. An electrode for an electrolytic or fuel cell comprising the composite materials produced by the process claimed in claim 1.

5,010,051

STAGED THREE-WAY CONVERSION CATALYST AND METHOD OF USING THE SAME

Wayne M. Rudy, Morristown, N.J., assignor to Engelhard Corporation, Iselen, N.J.

Filed Nov. 8, 1989, Ser. No. 433,890

Int. Cl.[5] B01J *21/04, 23/10, 23/42*

U.S. Cl. 502—304 12 Claims

1. A catalyst composition for converting HC, CO and NO_x in a gaseous stream flowed therethrough, the composition comprising an upstream catalyst member comprising a first catalytic material and a downstream catalyst member comprising a second catalytic material, wherein: (a) the first catalytic material is characterized by having an ignition temperature for substantially simultaneous conversion of HC, CO and NO_x which is lower than that of the second catalytic material and (b) the second catalytic material is characterized by having a

higher conversion efficiency than the first catalytic material for substantially simultaneous conversion of HC, CO and NO_x at operating temperatures above the ignition temperature.

5,010,052

ZIRCONIUM DIOXIDE GAS DESULFURIZATION CATALYST

Eric Quemere, Cormeilles/en/Parisis, France, assignor to Rhone-Poulenc Chimie, Courbevoie, France

Continuation of Ser. No. 44,337, Apr. 30, 1987, abandoned. This application Jun. 19, 1989, Ser. No. 368,087

Claims priority, application France, Apr. 30, 1986, 86 06261

Int. Cl.[5] B01J *21/06, 23/10*

U.S. Cl. 502—304 6 Claims

1. A catalyst adapted for the desulfurization of gases in a Claus process, comprising a solid shaped article including catalytically effective amounts of zirconium dioxide and cerium dioxide, a catalyst support including zirconium dioxide and a support phase including titanium dioxide.

5,010,053

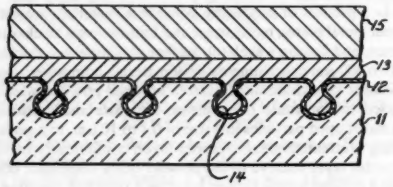
METHOD OF BONDING METALS TO CERAMICS

Victor A. Maroni, Naperville, Ill., assignor to Arch Development Corporation, Chicago, Ill.

Filed Dec. 19, 1988, Ser. No. 286,238

Int. Cl.[5] H01L *39/12;* C22C *29/12*

U.S. Cl. 505—1 12 Claims



1. A composite of a ceramic having a layer of Ag or Au present at the surface thereof, a first metal selected from the group consisting of In and alloys thereof bonded to the layer of Ag or Au, and a second metal bonded to the first metal.

5,010,054

METHOD FOR THE PREPARATION OF SUPERCONDUCTING PRODUCTS

Keld Johansen, Frederikssund; Erik Pedersen, Hørsholm, and Haldor F. A. Topsøe, Vedbøk, all of Denmark, assignors to Haldor Topsoe A/S, Denmark

Filed Jul. 8, 1988, Ser. No. 216,895

Claims priority, application Denmark, Jul. 10, 1987, 3581/87

Int. Cl.[5] H01B *12/00;* H01L *39/00*

U.S. Cl. 505—1 10 Claims

1. In a method for the preparation of a superconducting product on the basis of superconducting compounds having the general formula $(Me^1)(Me^2)_qCu_3O_x$, where Me^1 is at least one metal selected from the group consisting of yttrium, scandium and the lanthanides, Me^2 is at least one of the metals barium and strontium, p is a number from 0.8 to 2.5, q is a number from 0.8 to 3 and x is a number from 6 to 8.5, in which process oxides of Me^1, Me^2 and Cu are reacted with each other at an elevated temperature,

wherein the improvement comprises

(i) employing an oxide of Me^2 at least partly as the Me^2 peroxide,

(ii) placing the oxides under an oxygen-free atmosphere in a reaction vessel having deformable walls,

(iii) closing the vessel hermetically and placing it with its contents in an autoclave suitable for hot isostatic pressing, gradually subjecting it to a pressure of 800 to 3000 bar, heating it to a temperature in the range of 800 to 1400° C. and then cooling it without opening it, and

(iv) shaping the vessel with its contents at any time from the beginning of the heating procedure to the end of the cooling in order to form a desired product having superconducting properties.

5,010,055

USE OF EGF TO REVERSE THE CONTRACEPTIVE ACTIVITY OF MIS

Patricia K. Donahoe, Weston, Mass., assignor to The General Hospital Corporation, Boston, Mass.

PCT No. PCT/US87/01514, § 371 Date Apr. 25, 1988, § 102(e) Date Apr. 25, 1988, PCT Pub. No. WO88/00054, PCT Pub. Date Jan. 14, 1988

Continuation-in-part of Ser. No. 877,735, Jun. 24, 1986, Pat. No. 4,753,794. This PCT application Jun. 24, 1987, Ser. No. 205,239

Int. Cl.[5] A61K *37/36, 37/38*

U.S. Cl. 514—8 4 Claims

1. A method for reversing the contraceptive activity of Mullerian Inhibiting Substance which comprises providing to a female recipient of Mullerian Inhibiting Substance an Epidermal Growth Factor capable of reversing said contraceptive activity in an amount sufficient to achieve said reversal.

5,010,056

PHARMACEUTICAL COMPOSITION FOR INTRANASAL ADMINISTRATION, COMPRISING GH-RELEASING HORMONE, A CHOLINERGIC AGONIST AND OPTIONALLY A BILE SALT

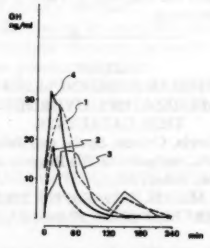
Franklin M. Boghen, Gambolò ; Franco Camanni, Turin; Piero Del Soldato, Monza; Ezio Ghigo, Turin, and Eugenio Müller, Milan, all of Italy, assignors to Pierrel Spa, Italy

Filed Jul. 25, 1988, Ser. No. 223,378

Claims priority, application Italy, Jul. 30, 1987, 21513 A/87

Int. Cl.[5] A61K *37/02, 9/06, 9/12, 9/14*

U.S. Cl. 514—12 11 Claims



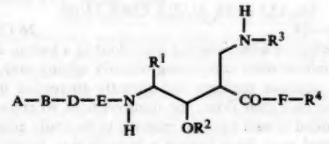
1. A pharmaceutical composition for intranasal administration suitable for the treatment of growth disorders and the diagnosis of hypophyseal functionality, comprising therapeutically effective quantities of GHRH, a cholinergic agonist and optionally a bile salt, together with pharmaceutically acceptable non-toxic excipients for intranasal administration.

5,010,057
RENIN-INHIBITING PEPTIDES HAVING AN AMINOMETHYL SIDE CHAIN

Rolf Henning, Wuppertal; Günter Benz, Velbert; Johannes-Peter Stasch, Wuppertal; Andreas Knorr, Erkrath, and Wolfgang Bender, Wuppertal all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 17, 1989, Ser. No. 395,392
Claims priority, application Fed. Rep. of Germany, Aug. 27, 1988, 3829086; Jan. 30, 1989, 3902615
Int. Cl.[5] A61K *37/02*
U.S. Cl. 514—018 11 Claims

1. An aminomethyl peptide of the formula



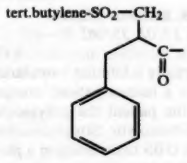
(I)

in which

A is selected from the group consisting of BOC, hydrogen and C_2H_5—O—CO—,

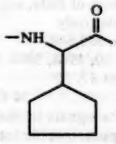
B is selected from the group consisting of Pro and a direct bond,

D is Phe or is



when A is hydrogen and B is a direct bond,

E is selected from the group consisting of His and



F is Ile,

R^1 is alkyl with 1 to 4 carbon atoms optionally substituted by cyclohexyl or phenyl,

R^2 and R^3 are each hydrogen and

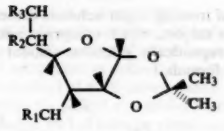
R^4 is selected from the group consisting of lower alkoxy and NH-R^{11} wherein R^{11} represents lower alkyl optionally substituted by pyridyl.

5,010,058
3,5,6-SUBSTITUTED DERIVATIVES OF 1,2-O-ISOPROPYLIDENE-α,D-GLUCOFURANOSE AND INTERMEDIATES FOR PREPARING THESE DERIVATIVES

Bruce Ronsen, River Forest; Sudershan K. Arora, Westchester, and Albert V. Thomas, Niles, all of Ill., assignors to 501 Greenwich Pharmaceuticals Incorporated, Ft. Washington, Pa.

Filed Jun. 22, 1989, Ser. No. 369,932
Int. Cl.[5] A61K *31/70*
U.S. Cl. 514—23 104 Claims

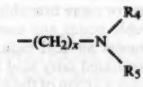
1. A monosaccharide compound of the formula I



I

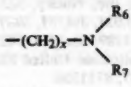
wherein

R_1 is a member selected from the group consisting of hydrogen, an alkoxyl radical containing from 4 to 11 carbon atoms, a hydroxyl residue, an aralkyl radical containing at least 7 carbon atoms, and a radical of the formula



in which x is a whole number up to 7 and R_4 and R_5 are each H, OH, or an alkoxy radical of up to 7 carbon atoms;

R_2 is a member selected from the group consisting of hydrogen, an alkoxy radical containing from 4 to 7 carbon atoms, a methylthio carbonyl, and a radical of the formula

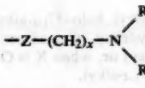


in which x is a whole number up to 7 and R_6 and R_7 are each H,OH, or an alkoxyl radical of up to 7 carbon atoms;

R_1 and R_2 together can form an isopropylidene radical;

R_3 is a member selected from the group consisting of hydrogen, a halogen, an alkylene radical, an aralkyl radical containing at least 7 carbon atoms, a radical of the formula

in which R_8 is hydrogen and R_9 is an alkyl radical containing up to eleven carbon atoms and a radical of the formula



in which Z is thio or amino, x is a whole number up to 7 and R_{10} r and R_{11} are each H, OH or an alkoxyl radical of up to 7 carbon atoms; and

R_2 and R_3 together can form an isopropylidene radical.

5,010,059

PHARMACEUTICAL PRODUCTS AND LACTOSYL COMPOUNDS

Richard R. Schmidt; Thomas Baer, both of Konstanz; Peter Zimmerman, Villingen, and Albrecht Wendel, Tübingen, all of Fed. Rep. of Germany, assignors to Solco Basel AG, Basel, Switzerland

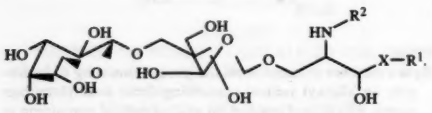
Filed Jun. 24, 1988, Ser. No. 210,838

Claims priority, application Switzerland, Jun. 26, 1987, 2407/87

Int. Cl.[5] A61K *31/70;* **C07H** *15/00*

U.S. Cl. 514—25 **10 Claims**

10. A method of treating organ ischemia caused by narrowing of vessels in a subject, which comprises administering to the subject a therapeutically effective amount of a lactosyl compound of the formula I



(I)

in which R^1 denotes an aliphatic radical which has 9 to 19 carbon atoms in a straight chain and which can have one or more double bonds, one or more branching methyl groups, or both one or more double bonds and one or more branching methyl groups, R^2 denotes an acyl radical of a saturated or singly or multiply unsaturated fatty acid having 14 to 24 carbon atoms, and X denotes a group of the formula $—CH_2—CH_2—$ or —CH=CH—.

5,010,060

METHOD OF TREATING HERPES SIMPLEX VIRAL INFECTION EMPLOYING PYRIMIDINE DERIVATIVES

Robert W. Lambert, Welwyn; Joseph A. Martin, Harpenden, and Gareth J. Thomas, Welwyn, all of England, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

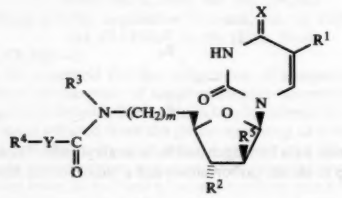
Division of Ser. No. 80,021, Jul. 31, 1987. This application Apr. 24, 1989, Ser. No. 342,277

Claims priority, application United Kingdom, Aug. 18, 1986, 8620070; May 14, 1987, 8711336

Int. Cl.[5] C07D *405/64;* **C07H** *19/06;* **A61K** *31/70*

U.S. Cl. 514—49 **11 Claims**

1. A method of treating herpes simplex viral infections which comprises administering an effective amount in the range of from about 1 mg to about 100 mg per day of a compound of the formula



wherein

R^1 is halogen, C_{1-4}-alkyl, halo-(C_{1-4}-alkyl) or C_{2-4}-alkanoyl,

R^2 is hydrogen, hydroxy, C_{1-4}-alkoxy, C_{1-4}-alkylthio or phenyl-(C_{1-4}-alkoxy) or, when X is O, also acyloxy,

R^3 is hydrogen or C_{1-4}-alkyl,

R^4 is a carbocyclic group or a heterocyclic group,

R^5 is hydrogen or fluorine,

m stands for zero, 1 or 2,

X is O or NH and Y is a direct bond, —CH=CH—, —C≡C— or a group of the formula of $(Z)_n$-A- (a) in which A is a C_{1-18}-alkylene group which is optionally substituted by one or two phenyl groups, Z is O, S, SO or SO_2 and n stands for zero or 1, with the proviso that R^1 is different from iodine, when R^2 is hydroxy or benzoyloxy, R^3 is hydrogen, R^4 is unsubstituted phenyl, R^5 is hydrogen, m stands for zero, X is O, and Y is a direct bond,

or a tautomer thereof.

5,010,061

GUAR FLOUR

Ulrich Speck, Benediktinerstrasse 50, D-1000 Berlin 28, and Panayiotis Roumeliotis, Frankfuter Strasse 12, D-6100 Darmstadt, both of Fed. Rep. of Germany

Continuation of Ser. No. 362,489, Jun. 7, 1989, abandoned, which is a continuation of Ser. No. 31,999, Mar. 27, 1987, abandoned. This application Aug. 6, 1990, Ser. No. 564,673

Claims priority, application Fed. Rep. of Germany, Apr. 18, 1986, 3613219

Int. Cl.[5] A61K *31/715;* **C08B** *37/00*

U.S. Cl. 514—54 **26 Claims**

1. In a method of administering guar flour to a human desiring such administration comprising directly adding said guar flour to an aqueous medium and directly thereafter orally administering said guar flour, the improvement wherein said guar flour added to said aqueous medium to be orally administered is natural guar flour having a particle size distribution wherein 90 to 100% by weight of the guar flour particles have a diameter of 50 μm to 1500 μm and said natural guar flour having said distribution neither contains nor has been treated with additives which substantially affect the form or consistency of said guar flour particles or which substantially delay or reduce the swelling ability of said guar flour particles.

5,010,062

THERAPEUTIC AGENT AND METHOD OF INHIBITING VASCULARIZATION OF TUMORS

Carl G. Hellergvist, Brentwood, Tenn., assignor to Vanderbilt University, Nashville, Tenn.

Filed Sep. 25, 1989, Ser. No. 411,674

Int. Cl.[5] A61K *37/02, 39/085*

U.S. Cl. 514—54 **8 Claims**

1. The method of at least partially inhibiting vascularization of a developing solid tumor in a human patient, comprising parenterally administering to the patient the polysaccharide toxin produced by group B β-hemolytic Streptococcus bacteria known as GBS toxin, said GBS toxin being in a purified, toxin-active form and being administered in an amount effective for said inhibition.

5,010,063

HEPARIN DERIVATIVES AND PROCESS FOR THEIR PREPARATION

Silvano Piani, Bologna; Gianfranco Tamagnone, Casafecchio di Reno; Raul R. Alpino, Bologna; Maria R. Milani, Trebbo di Reno, and Marinella Fantuz, Bologna, both of Italy, assignors to Alfa Wasserman S.P.A., Alanno Scalo, Italy

Filed May 26, 1989, Ser. No. 357,548

Claims priority, application Italy, Jun. 10, 1988, 3504 A/88

Int. Cl.[5] A61K *31/725;* **C08B** *37/10*

U.S. Cl. 514—56 **14 Claims**

1. A heparin derivative which exhibits signals in the ^{13}C-NMR spectrum at about 53 and about 54 ppm, specific rotatory power $[\alpha]^{20}$ between about +50° and about +90° in aqueous solution, sulfur content between about 8% and about 11% and sulfate/carboxyl ratio between about 1.50 and about 2.20.

4. A process for the preparation of a heparin derivative which exhibits signals in the ^{13}C-NMR spectrum at about 53 and about 54 ppm, specific rotatory power between about +50° and about +90° in aqueous solution, sulfur content between about 8% and about 11% and sulfate/carboxyl ratio

between about 1.50 and about 2.20 which comprises the steps of: (a) treating a heparinic material with an aqueous solution of a base which is an alkali or alkaline earth metal hydroxide of a concentration between about 0.01N and about 1N for a period of time between 0.5 and 24 hours at a temperature between about 35° C. and about 60° C. to obtain a reaction mixture; (b) purifying said reaction mixture by percolation through an ion exchange resin or by dialysis; and (c) precipitating said heparin derivative by adding from about 2 to about 4 volumes of an alcohol containing from 1 to 3 carbon atoms at about a neutral pH.

5,010,064

INCLUSION COMPLEXES OF DIPYRIDAMOLE WITH CYCLODEXTRINS

Giancarlo Fregnan, Milan; Guido Vandoni, Correzzana, and Giangiacomo Torri, Milan, all of Italy, assignors to Edmond Pharma s.r.l., Milan, Italy

Filed Jun. 1, 1988, Ser. No. 201,038

Claims priority, application Italy, Jun. 17, 1987, 20925 A/87

Int. Cl.[5] A01N *43/40*; A61K *31/715*; C08B *37/16*

U.S. Cl. 514—58 **6 Claims**

1. A compound obtained by complexing dipyridamole with beta-cyclodextrin in the molar ratio dipyridamole: cyclodextrin between 1:1 and 1:12 respectively.

5,010,065

CYCLODEXTRIN CLATHRATES OF 5-CYANOPROSTACYCLIN DERIVATIVES AND THEIR USE AS PHARMACEUTICAL AGENTS

Werner Skuballa; Helmut Dahl; Helmut Vorbrueggen; Olaf Loge, and Karl-Heinz Thierauch, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

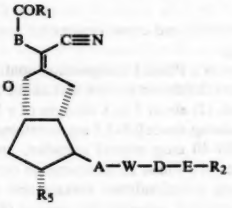
Filed Nov. 28, 1988, Ser. No. 276,754

Claims priority, application Fed. Rep. of Germany, Nov. 27, 1987, 3740838

Int. Cl.[5] A61K *31/335*; C07D *307/93*

U.S. Cl. 514—58 **10 Claims**

1. A cyclodextrin clathrate of a 5-cyanoprostacyclin of the formula I



I

wherein

R_1 is OR_3 or NHR_4;

R_3 is hydrogen; C_{1-10}-alkyl; C_{1-10}-alkyl substituted by halo, C_{1-4}-alkoxy, C_{6-10}-aryl, C_{6-10} aryl substituted as defined below for R_2, mono- or di-(C_{1-4}-alkyl)-amino, or tri (C_{1-4}-alkyl)ammonium; C_{4-10}cycloalkyl; C_{4-10}-cycloalkyl substituted by C_{1-4}-alkyl; C_{6-10}-aryl; C_{6-10}-aryl substituted as defined for R_2 below; or an aromatic heterocycle of 5- or 6-members containing 1 or 2, O, S or N hetero atoms;

R_4 is an acyl group of a C_{1-15}-hydrocarbon carboxylic or sulfonic acid;

B is alkylene of 2-10 C atoms,

A is —CH_2—CH_2—, cis—CH=CH—, trans—CH=CH— or —C≡C;

W is RO-methylene or

the OR group being in the alpha or beta position;

R is H or C_{1-15}-acyl derived from a hydrocarbon carboxylic acid, or is tetrahydropyranyl, alpha-ethoxyethyl, tetrahydrofuranyl, trimethylsilyl, tribenzylsilyl, or dimethyl-tert-butylsilyl;

D and E together mean a direct bond; or

D is alkylene of 1–5 C atoms;

E is oxygen, sulfur or a direct bond;

R_2 is alkyl of 1–10 carbon atoms; alkenyl of 2–10 C-atoms; C_{1-10}-alkyl or C_{2-10}-alkenyl substituted by C_{6-10}-aryl or C_{6-10}-aryl substituted as defined for substituted C_{6-10}-aryl below; cycloalkyl of 4–10 carbon atoms; C_{4-10}-cycloalkyl substituted by C_{1-4}-alkyl; aryl of 6–10 carbon atoms; C_{6-10}-aryl substituted by 1–3 halogen atoms, a phenyl group, 1–3 alkyl groups each of 1–4 carbon atoms, or a chloromethyl, fluoromethyl, trifluoromethyl, carboxy, C_1–C_4-alkoxy or hydroxy group; or an aromatic heterocycle of 5- or 6-members containing 1 or 2 O, S, or N hetero atoms; and

R_5 is OR;

or when R_3 is hydrogen, a physiologically acceptable salt thereof with a base.

5,010,066

BIOCIDAL COMPOSITIONS AND USE THEREOF CONTAINING A SYNERGISTIC MIXTURE OF N-TRIBUTYL TETRADECYL PHOSPHONIUM CHLORIDE AND N-DODECYLGUANIDINE

Deborah K. Donofrio, The Woodlands, and Wilson K. Whiteketle, Conroe, both of Tex., assignors to Betz Laboratories, Inc., Trevose, Pa.

Filed Aug. 13, 1990, Ser. No. 566,958

Int. Cl.[5] A01N *37/52, 57/00*

U.S. Cl. 514—75 **7 Claims**

1. A bacterial inhibiting composition comprising a synergistic mixture of (a) n-tributyl tetradecyl phosphonium chloride and (b) n-dodecylguanidine or a water soluble salt thereof wherein the weight ratio of (a):(b) is from about 28.5:1 to 2.85:1.

5,010,067

TRIGLYCERIDE-WATER EMULSION PHARMACEUTICAL VEHICLES

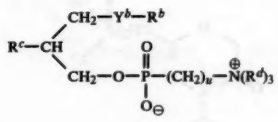
Dean A. Handley; William J. Houlihan, both of Mountain Lakes, and David B. Weinstein, Berkeley Heights, all of N.J., assignors to Sandoz Pharmaceuticals Corp., E. Hanover, N.J.

Filed Jul. 19, 1988, Ser. No. 221,054

Int. Cl.[5] A61K *31/66, 31/685, 31/445, 31/34*

U.S. Cl. 514—75 **25 Claims**

1. An injectable pharmaceutical composition useful in treating tumors and exhibiting reduced detergent effects at the injection site upon intravenous administration comprising: (1) an anti-tumor agent selected from a compound of formula IV:



IV

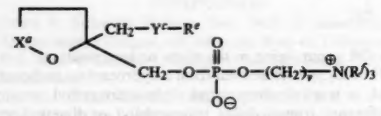
in which

R^b is C_{16-20} normal-alkyl;

R^c is o-methyl, o-ethyl, o-benzyl or CH_2OCH_3;

u is an integer of from 2 to 8;

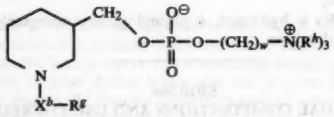
R^d is methyl or ethyl; and
Y^b is -O- or -S- ,
a compound of formula V:



V

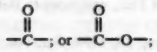
in which
X^a is $-CH_2-$ or

R^e is C_{16-20} normal-alkyl;
R^f is methyl or ethyl;
Y^c is $-CH_2-$ or -O- , and
v is an integer of from 2 to 8, and
a compound of formula VI:



VI

in which
X^b is



w is an integer of from 2 to 8;
R^g is C_{16-20} normal-alkyl; and
R^h is methyl or ethyl;
and (2) as a vehicle therefor, an emulsion comprising:
(a) about 5% to 25% fatty acid triglycerides;
(b) up to 1.2% egg phosphatides, purified;
(c) 2.5% of glycerine; and
the balance water, with sufficient sodium hydroxide added so that the pH of said emulsion is about 8.

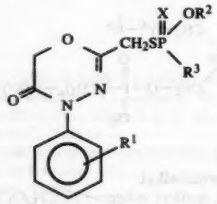
5,010,068

OXADIAZINYL ORGANOPHOSPHORUS PESTICIDES

Mark A. Dekeyser, Waterloo, Canada, and Richard C. Moore, Wallingford, Conn., assignors to Uniroyal Chemical Company, Inc., Middlebury, Conn. and Uniroyal Chemical Ltd. Ltee., Don Mills, Canada

Filed Dec. 21, 1989, Ser. No. 454,668
Int. Cl.[5] C07D *273/04;* A01N *57/00*
U.S. Cl. 514—79 **25 Claims**

1. A compound having the formula:



wherein X is O or S;
R^1 is:
hydrogen,
C_1–C_{12} alkyl,
C_2–C_{13} alkoxy,
C_7–C_9 aralkyl,
C_1–C_4 alkylsulfonyl,
nitro,
phenyl or
trihalomethyl, wherein halo is fluorine, chlorine or bromine;
R^2 is C_1–C_4 alkyl; and
R^3 is C_1–C_4 alkyl
C_1–C_4 alkoxy, and
C_1–C_4 alkylthio.

15. An insecticidal, acaricidal or nematicidal method comprising applying a loci to be treated an effective amount of a compound according to claim **1**.

5,010,069

STABLE LIQUID FORM OF 5-AMINOSALICYLIC ACID

Carey B. Bottom, Overland Park, and Margaret N. Kwoka, Merriam, both of Kans., assignors to Marion Laboratories, Inc., Kansas City, Mo.

Filed May 15, 1989, Ser. No. 352,064
Int. Cl.[5] A61K *31/615, 31/34*
U.S. Cl. 514—166 **17 Claims**

1. A stabilized aqueous solution having a concentration of 0.1 to 10 g/100 ml of 5-aminosalicylic acid wherein a buffer consists essentially of an intrinsic, water soluble nontoxic alkali, alkali metal or alkaline earth metal salt of 5-aminosalicylic acid, said solution having a pH of 3 to 5.

5,010,070

GRADUATED ESTROGEN CONTRACEPTIVE

Roger M. Boissonneault, Long Valley, N.J., assignor to Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 340,974, Apr. 20, 1989, Pat. No. 4,962,098, which is a continuation-in-part of Ser. No. 61,646, Jun. 15, 1987, abandoned, which is a continuation-in-part of Ser. No. 659,144, Oct. 9, 1984, abandoned. This application May 22, 1990, Ser. No. 526,934
Int. Cl.[5] A61K *31/56*
U.S. Cl. 514—171 **12 Claims**

4. A multiphase combination and contraceptive kit comprising a package containing:
(1) about 4 to 7 dosages of a Phase I composition containing about 0.5–1.5 mg norethindrone acetate and about 10–30 mcg ethinyl estradiol; (2) about 5 to 8 dosages of a Phase II composition containing about 0.5–1.5 mg norethindrone acetate and about 20–40 mcg ethinyl estradiol, and (3) about 7 to 12 dosages of a Phase III composition containing about 0.5–1.5 mg norethindrone acetate and about 30–50 mcg ethinyl estradiol, wherein the amount of ethinyl estradiol is increased stepwise over the three compositions.

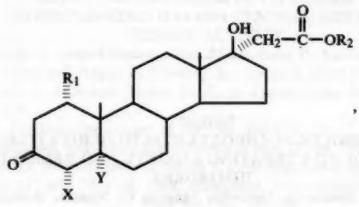
5,010,071

ANDROSTANE DERIVATIVES

Dieter Bittler; Henry Laurent; Petra Rach, and Michael Topert, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

Filed Jul. 13, 1989, Ser. No. 379,399
Claims priority, application Fed. Rep. of Germany, Jul. 13, 1988, 3824247
Int. Cl.[5] A61K *31/56;* C07J *1/00*
U.S. Cl. 514—178 **17 Claims**

1. An androstane derivative of the formula



(I)

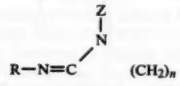
wherein
R_1 is hydrogen or methyl,
X and Y are each hydrogen and
R_2 is hydrogen or C_{1-6}-alkyl.

5,010,072
LACTAMIMIDES AS CALCIUM ANTAGONISTS

Michael G. Palfreyman; Norbert L. Wiech; Hsien C. Cheng, and John M. Kane, all of Cincinnati, Ohio, assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Filed Jun. 28, 1988, Ser. No. 212,544
Int. Cl.[5] A61K *31/33, 31/44, 31/55, 31/445*
U.S. Cl. 514—183 **5 Claims**

1. A method of effecting calcium antagonism in a patient in need thereof which comprises administering to the patient a calcium antagonism effective amount of a compound of the formula



wherein
Z is hydrogen or lower alkyl of from 1 to 4 carbon atoms;
n is an integer of from 3 to 16; and
R is 1- or 2- adamantyl or 1- or 2- norbornyl
or a pharmaceutically acceptable acid addition salt thereof or an individual optical or geometric isomer.

5,010,073
USE OF LIPOSOMES AS CARRIERS FOR METALLOPORPHYRINS

Attallah Kappas, and George S. Drummond, both of New York, N.Y., assignors to The Rockefeller University, New York, N.Y.

Continuation-in-part of Ser. No. 417,298, Oct. 5, 1989, abandoned. This application Feb. 26, 1990, Ser. No. 485,174
The portion of the term of this patent subsequent to Apr. 14, 2004, has been disclaimed.
Int. Cl.[5] A61K *31/40, 31/555, 9/127;* **C07D** *209/94*
U.S. Cl. 514—185 **20 Claims**

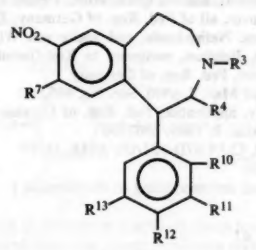
1. A pharmaceutical composition for improved inhibition of heme oxygenase activity in mammals comprising a liposomal metalloporphyrin, the metalloporphyrin component of which is a heme oxygenase inhibitor.

5,010,074
NOVEL BENZAZEPINE DERIVATIVES

Frederik Gronwald, Vedbaek; Peter H. Andersen, Vanlse; Peter Faarup, Vaerlose; Erling Guddal, Brondby; Kristian T. Hansen, Kobenhavn; Louis B. Hansen, and Erik B. Nielsen, both of Vaerlose, all of Denmark, assignors to Novo Nordisk A/S, Bagsvaerd, Denmark

Filed Jun. 12, 1989, Ser. No. 365,250
Claims priority, application Denmark, Jun. 15, 1988, 3251/88
Int. Cl.[5] C07D *223/14, 223/16;* **A61K** *31/55*
U.S. Cl. 514—213 **30 Claims**

1. A 2,3,4,5-tetrahydro-1H-3-benzazepine selected from those of the formula I



(I)

wherein R^3 represents C_{1-3}-alkyl or C_{3-7}-cycloalkyl; R^4 represents hydrogen; R^7 represents hydroxy or lower alkoxy; one of R^{10}, R^{11}, R^{12} and R^{13} represents trifluromethyl and the others independently represent hydrogen or R^{11} together with either R^{10} or R^{12} represents a bridge chosen from among —O—CH-2—CH—, —O—CH_2—CH_2—CH_2—, —O—CH=CH—, —CH_2—CH_2—CH_2—, —CH_2—CH=CH— and —CH-2—CH_2—CH_2—, and the remainder of R^{10}, R^{11}, R^{12} and R^{13} each represents hydrogen, and pharmaceutically-acceptable acid additional salts thereof.

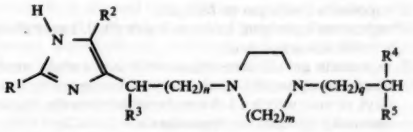
14. A pharmaceutical composition useful for treating CNS ailments containing an effective amount of a benzazepine of claim 1 or a pharmaceutically-acceptable acid addition salt thereof together with a pharmaceutically-acceptable carrier or diluent.

5,010,075
SUBSTITUTED IMIDAZOLYL-ALKYL-PIPERAZINE AND -DIAZEPINE DERIVATIVES

Jean C. Pascal, Cachan, France; Chi-Ho Lee, Palo Alto, Calif.; Brian J. Alps, Linlithgow, Scotland; Henri Pinhas, Paris, France, and Roger L. Whiting, Los Altos, Calif., assignors to Syntex Pharmaceuticals Ltd., Berkshire, England

Division of Ser. No. 313,656, Feb. 21, 1989, Pat. No. 4,935,417, which is a division of Ser. No. 42,181, Apr. 24, 1987, Pat. No. 4,829,065. This application Apr. 6, 1990, Ser. No. 505,379
Int. Cl.[5] C07D *243/08, 403/06;* **A61K** *31/55*
U.S. Cl. 514—218 **13 Claims**

1. A compound having the structure represented by the formula:



wherein:
R^1 is aryl, lower alkyl, cycloalkyl or hydrogen;
R^2 is aryl, lower alkyl or hydrogen;
R^3 is lower alkyl, hydroxy, or hydrogen;
R^4 is aryl or hydrogen;

R^5 is aryl or hydrogen;
m is three;
n is zero, one or two, provided that when R^3 is hydroxy, n is one or two; and
q is zero, one, two, or three;
or a pharmaceutically acceptable salts thereof.

10. A pharmaceutical formulation comprising a compound of claim 1 and a pharmaceutically acceptable excipient.

5,010,076
1,7-FUSED 1H-INDOLE-2-CARBOXYLIC ACID-N-(1,4-BENZODIAZEPIN-3-YL)AMIDES

Harald Waldeck, Hanover; Werner Benson, Seelze; Horst Zeugner, Hanover; Klaus-Ullrich Wolf, Uetze; Peter-Colin Gregory, Hanover, all of Fed. Rep. of Germany; Derk Hamminga, Leusden, Netherlands, and Ineke van Wijngaarden, Oud-Turnhout, Belgium, assignors to Kali-Chemie Pharma GmbH, Hanover, Fed. Rep. of Germany

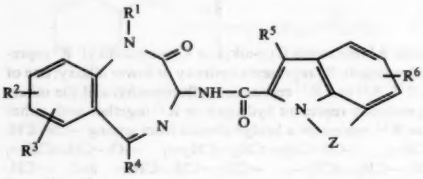
Filed Mar. 7, 1990, Ser. No. 489,502

Claims priority, application Fed. Rep. of Germany, Mar. 8, 1989, 3907389; Mar. 8, 1989, 3907390

Int. Cl.[5] C07D *521/00;* A61K *31/55*

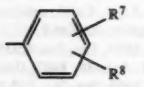
U.S. Cl. 514—221 **10 Claims**

1. A compound corresponding to the formula I



(I)

wherein
R^1 represents hydrogen, lower alkyl or cycloalkylalkyl with 4–7 carbon atoms,
R^2 represents hydrogen, halogen, lower alkyl, lower alkoxy or trifluoromethyl, and
R^3 represents hydrogen, halogen, lower alkyl or lower alkoxy, or
R^2 and R^3 are bonded to two adjacent carbon atoms and together denote an alkylenedioxy group with 1–2 carbon atoms,
R^4 represents cycloalkyl with 5 to 6 carbon atoms, thiophene or an optionally substituted phenyl group a



(a)

in which
R^7 represents hydrogen, halogen, lower alkyl, lower alkoxy or trifluoromethyl, and
R^8 represents hydrogen, halogen, lower alkyl or lower alkoxy,
R^5 represents hydrogen or halogen,
R^6 represents hydrogen, halogen, lower alkyl, lower alkoxy or trifluoromethyl, and
Z represents an alkylene chain with 2–4 carbon atoms, which can optionally be mono- or disubstituted by lower alkyl, or onto which a 5–6-membered carbocyclic ring can optionally be fused, or represents a —X—CH_2—CH_2— chain in which X is bonded to the phenyl ring of the indole structure and represents oxygen or sulfur,
and the pharmaceutically acceptable acid addition salts thereof.

10. A pharmaceutical composition comprising an effective CCK antagonizing amount of a compound according to claim 1, and at least one conventional pharmaceutical adjuvant or carrier.

5,010,077
β-CARBOLIN-3-CARBOXYLIC ACID DERIVATIVES USEFUL FOR TREATING ANXIETY AND RELATED DISORDERS

Claus T. Braestrup, Gentofte; Mogens C. Nielsen, Roskilde; Joergen A. Christensen, Virum; Mogens Engelstoft, Vaerloese; Henning Schou, Copenhagen, all of Denmark; Ulrich Eder, Berlin, Fed. Rep. of Germany; Günter Neef, Berlin, Fed. Rep. of Germany; Andreas Huth, Berlin, Fed. Rep. of Germany; Dieter Rahtz, Berlin, Fed. Rep. of Germany, and Ralph Schmiechen, Berlin, Fed. Rep. of Germany, assignors to A/S Ferrosan, Soeborg, Denmark and Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

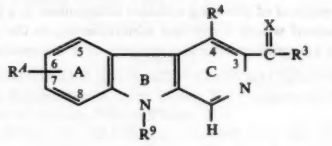
Continuation of Ser. No. 731,244, May 7, 1985, abandoned, which is a continuation of Ser. No. 433,308, Oct. 7, 1982, abandoned, which is a division of Ser. No. 182,244, Aug. 28, 1980, Pat. No. 4,731,536. This application Apr. 25, 1988, Ser. No. 188,145

Claims priority, application Denmark, Aug. 29, 1979, 3622/79; Feb. 29, 1980, 889/80; Fed. Rep. of Germany, Apr. 22, 1980, 3015816; Jun. 20, 1980, 3023567

Int. Cl.[5] C07D *471/04;* A61K *31/535*

U.S. Cl. 514—228.8 **15 Claims**

1. A β-carboline-3-carboxylic acid derivative of the formula



wherein:
X is oxygen, sulphur or NR^{10}, wherein R^{10} is hydrogen or alkyl;
R^3 is $NR^{11}R^{12}$, wherein R^{11} and R^{12} are the same or different and each is (i) hydrogen, (ii) hydroxy, (iii) C_{1-10}-alkyl, (iv) C_{3-7}-cycloalkyl, or each of groups (iii)–(iv) optionally substituted with hydroxy, carboxamido, or carboxy, or (v) amino optionally substituted with C_{1-10}-alkyl, or wherein R^{11} and R^{12} together with the connecting nitrogen atom form pyrrolidine, piperidine, 3-methoxycarbonyl-piperidine, 4-hydroxy-3-ethoxycarbonylpiperidine, or N-methyl-piperazine, with the proviso that R^{11} and R^{12} cannot both be hydroxy;
R^4 is hydrogen, C_{1-10}-alkyl, C_{3-7}-cycloalkyl, or phenyl;
R^4 is R^{13}, F, Cl, Br, I, NO_2, $NR^{13}R^{14}$, $NHCOR^{13}$, CN, $COOR^{13}$, OR^{13}, SCH_3 or $SO_2NR^{11'}R^{12'}$, wherein R^{13} and R^{14} each is hydrogen or C_{1-6}-alkyl, and wherein there are 1–2 identical or different R^4's and wherein $R^{11'}$ and $R^{12'}$ can be the same or different and each is H or alkyl, or together $R^{11'}$ and $R^{12'}$ form a saturated heterocyclic group as defined for R^{11} and R^{12}; and
R^9 is H;
with the proviso that R^4 does not represent hydrogen when R^{11} and R^{12} are each hydrogen or C_{1-3} alkyl, when X is oxygen or sulfur and when R^4 is hydrogen, C_{1-5}-alkyl or phenyl.

6. A method of inducing a tranquilizing effect in a patient in need of such treatment which comprises administering to the patient an amount of a compound of claim 1 effective as a tranquilizer.

5,010,078

ARYL- AND HETEROARYL PIPERAZINYL CARBOXAMIDES HAVING CENTRAL NERVOUS SYSTEM ACTIVITY

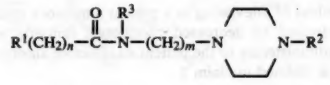
Magid A. Abou-Gharbia, Glen Mills; John P. Yardley, Gulph Mills, and Wayne E. Childers, Jr., Yardley, all of Pa., assignors to American Home Products Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 335,075, Apr. 7, 1989, abandoned, which is a continuation-in-part of Ser. No. 297,460, Jan. 13, 1989, abandoned, which is a continuation-in-part of Ser. No. 197,890, May 24, 1988, abandoned. This application Mar. 14, 1990, Ser. No. 493,179

Int. Cl.[5] A61K *31/505;* C07D *403/04, 403/14*

U.S. Cl. 514—252 10 Claims

1. A compound having the formula



(I)

wherein R^1 is 1-adamantyl, 3-methyl-1-adamantyl, 3-noradamantyl, unsubstituted or substituted-2-indolyl, 3-indolyl, 2-benzofuranyl or 3-benzofuranyl wherein the substituents are selected from lower alkyl, lower alkoxy and halo; R^2 is unsubstituted or substituted pyrimidinyl, wherein the substituents are selected from lower alkyl, lower alkoxy, trifluoromethyl and halo; R^3 is H or lower alkyl of 1 to 3 carbon atoms; n is the integer 0 or 1; and m is the integer from 2 to 5; or the pharmaceutically acceptable salts thereof.

5,010,079

INDOLONE DERIVATIVES, THEIR PREPARATION AND THEIR APPLICATION IN THERAPY

Philippe Manoury, Verrieres le Buisson; Jean Binet, Breuillet; Daniel Obitz, Fontenay aux Roses; Gerard Defosse, Paris; Elisabeth Dewitte, Saint-Gratien, and Corinne Veronique, Villejuif, all of France, assignors to Synthelabo, Paris, France

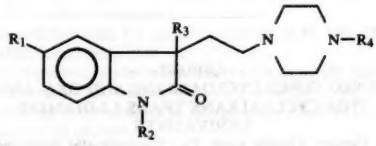
Filed Aug. 2, 1989, Ser. No. 388,373

Claims priority, application France, Aug. 3, 1988, 8810482

Int. Cl.[5] C07D *401/06, 403/06;* A61K *31/47, 31/495*

U.S. Cl. 514—253 8 Claims

1. An indolone derivative which is a compound of formula (I):



in which

R_1 is a hydrogen or halogen atom or a (C_{1-4})alkyl radical,

R_2 is a hydrogen atom or a (C_{1-4})alkyl radical,

R_3 is a hydrogen atom, a (C_{1-4})alkyl radical or an S-$(C_1$-4) alkyl radical; and

R_4 is a phenyl, chlorophenyl, naphthyl, 7-methoxy-1-naphthyl, 6-methoxy-1-indanyl, 2-methoxy-6-pyridyl, 3-methoxy-2-pyridyl, isoquinolyl, 7-methoxy-1-isoquinolyl, 7-methoxy-1,2,3,4-tetrahydro-1-naphthyl or 7-fluoro-1-naphthyl radical;

or a pharmaceutically acceptable acid addition salt thereof.

5,010,080

USE OF HETEROCYCLIC AMIDES TO INHIBIT TUMOR METASTASIS

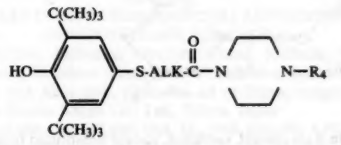
George C. Fuller, Gross Point, Mich.; George R. Martin, Bethesda, Md.; Richard A. Mueller, Glencoe, Ill., and Reuven Reich, Silver Spring, Md., assignors to G. D. Searle & Co., Chicago, Ill. and The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Filed Dec. 2, 1988, Ser. No. 279,584

Int. Cl.[5] A61L *31/495*

U.S. Cl. 514—255 6 Claims

1. A method of inhibiting invasive activity and related metastasis of tumor cells in a mammal without treating the tumor cells comprising administering an amount of a compound of the formula



wherein Alk is straight or branched chain lower alkylene and R_4 is selected from the group consisting of hydrogen, lower alkyl, phenyl, or benzyl; or a pharmaceutically acceptable salt thereof, which is effective to inhibit tumor cell invasive activity and related metastasis to a mammal having tumor cells sensitive to said compound.

5,010,081

6-THIOXANTHINES

Peter Hofer, Liestal, Switzerland, assignor to Euroceltique, S.A., Luxembourg, Luxembourg

Continuation-in-part of Ser. No. 322,364, Mar. 13, 1989, abandoned, which is a continuation of Ser. No. 78,545, Jul. 28, 1987, Pat. No. 4,925,847, which is a continuation-in-part of Ser. No. 699,254, Feb. 7, 1985, Pat. No. 4,710,503. This application Oct. 2, 1989, Ser. No. 415,970

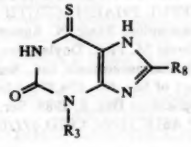
Claims priority, application United Kingdom, Aug. 2, 1986, 8618931

The portion of the term of this patent subsequent to Dec. 1, 2004, has been disclaimed.

Int. Cl.[5] C07D *473/38;* A61K *31/52*

U.S. Cl. 514—263 13 Claims

1. A 6-thioxanthine of formula I or a pharmaceutically acceptable salt thereof



I

wherein R_3 is selected from a group consisting of ethyl, n-propyl, isopropyl, isobutyl, secondary butyl, cyclopropylmethyl, n-pentyl, 2-methylbutyl, 3-methylbutyl and 2,2-dimethylpropyl, and R_8 is selected from a group consisting of ethyl, isopropyl, cyclopropyl, n-butyl, isobutyl, t-butyl, cyclobutyl and n-pentyl, provided that

when R_3 is ethyl, R_8 is selected from isopropyl, cyclopropyl, isobutyl, t-butyl, cyclobutyl and n-pentyl.

when R_3 is n-propyl, R_8 is selected from isopropyl, isobutyl and t-butyl

when R_3 is isobutyl, R_8 is selected from ethyl, isopropyl, cyclopropyl, isobutyl, t-butyl, cyclobutyl and n-pentyl,

when R_3 is n-pentyl, 2-methylbutyl, 3-methylbutyl, or 2,2-

dimethylpropyl R_8 is selected from isopropyl, cyclopropyl, n-butyl, isobutyl, t-butyl, cyclobutyl and n-pentyl.

5,010,082

PESTICIDAL 2-HYDRAZINOPYRAMIDINE COMPOUNDS

Peter Riebli, Buckten, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

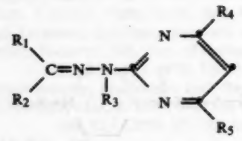
Filed Sep. 22, 1989, Ser. No. 411,337

Claims priority, application Switzerland, Sep. 28, 1988, 3595/88

Int. Cl.[5] C07D *239/46, 239/48;* A01N *43/54*

U.S. Cl. 514—272 21 Claims

1. A compound of formula I



(I)

wherein R_1 is phenyl, naphthyl, phenyl substituted from one to five times by R_6, or naphthyl substituted from one to five times by R_6; R_2 is C_1–C_6alkyl, C_1–C_6alkyl substituted at least once by halogen, C_1–C_3alkoxy or by C_3–C_6cycloalkyl, C_3–C_6cycloalkyl, C_1–C_4alkoxycarbonyl, phenyl, phenyl mono- to trisubstituted by halogen, C_1–C_3alkoxy by C_1–C_3alkyl, benzyl, or benzyl mono- to tri-substituted by halogen, C_1–C_3alkoxy or by C_1–C_3alkyl; R_3 is hydrogen, C_1–C_6alkyl or the radical CO-R_7; R_4 is C_3–C_6cycloalkyl or C_3–C_6cycloalkyl mono- to trisubstituted by halogen or by methyl; R_5 is hydrogen, C_1–C_6alkyl, C_1–C_6alkyl substituted at least once by halogen, hydroxy, cyano or by C_1–C_3alkoxy, R_5 is also C_3–C_5alkenyl, halogen, hydroxy, C_1–C_3alkoxy, C_1–C_3haloalkoxy, C_3–C_6cycloalkyl or C_1–C_3alkylthio; R_6, independently of any other, is C_1–C_6alkyl, C_1–C_3alkyl substituted by C_1–C_3alkoxy, or C_1–C_4alkoxy, C_1–C_3haloalkyl, C_1–C_3haloalkoxy, halogen, cyano, nitro, hydroxy or the radical $S(O)_n$-C_1–C_4alkyl; R_7 is C_1–C_6alkyl, or C_1–C_6alkyl substituted at least once by halogen or by C_1–C_3alkoxy; and n is 0, 1 or 2; including the acid addition compounds and the metal salt complexes thereof.

17. A method of controlling or preventing attacks on cultivated plants by phytopathogenic microorganisms, which method comprises applying to the plant, parts of the plant or the locus thereof, as active ingredient, a compound of formula I according to claim 1.

5,010,083

2,6-METHANO-1,3-BENZODIAZOCINE COMPOUNDS WHICH HAVE USEFUL PHARMACEUTICAL UTILITY

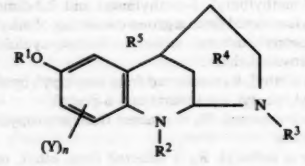
Richard C. Allen, Flemington; Marc N. Agnew, Bridgewater, both of N.J., and David M. Fink, Doylestown, Pa., assignors to Hoechst-Roussel Pharmaceuticals, Inc., Somerville, N.J.

Continuation-in-part of Ser. No. 174,274, Mar. 28, 1988, abandoned. This application Dec. 6, 1989, Ser. No. 446,743

Int. Cl.[5] A61K *31/44;* C07D *471/06*

U.S. Cl. 514—292 32 Claims

1. A compound of the formula:



wherein R^1 is selected from the group consisting of hydrogen, loweralkyl, loweralkylcarbonyl, loweralkylaminocarbonyl, cycloalkylaminocarbonyl, arylalkylaminocarbonyl, loweralkoxycarbonyl, aryloxycarbonyl, and arylaminocarbonyl; R^2 and R^3 are independently selected from the group consisting of hydrogen, loweralkyl, cycloalkylloweralkyl, aryllowerallcyl, and loweralkenyl; R^4 and R^5 are independently hydrogen or loweralkyl; Y is halogen, loweralkyl, nitro, amino, loweralkylcarbonylamino, arylcarbonylamino, formyl or loweralkylaminocarbonyl; the term aryl signifying a phenyl group optionally substituted by up to 3 substituents each of which is independently loweralkyl, loweralkoxy, halogen, trifluoromethyl, nitro or cyano; the term cycloalkyl signifying a cyclic hydrocarbon radical of the formula $-C_xH_{2x-1}$, wherein X is an integer having a value of 3 to 7, inclusive; and n is an integer having a value of zero or 1; or a geometrical isomer, optical antipode or a pharmaceutically acceptable acid addition salt thereof.

32. A method of alleviating in a patient a memory dysfunction characterized by decreased cholinergic function which comprises administering to the patient an effective amount of a compound as defined in claim 1.

5,010,084

IMIDAZOQUINOLONE DERIVATIVES

Fumio Suzuki, Mishima; Takeshi Kuroda; Yoshisuke Nakasato, both of Shizuoka; Kenji Ohmori, Mishima, and Haruhiko Manabe, Shizuoka, all of Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

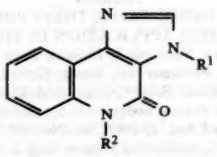
Filed Jul. 18, 1990, Ser. No. 553,551

Claims priority, application Japan, Jul. 18, 1989, 1-185087

Int. Cl.[5] C07D *471/02;* A61K *31/44*

U.S. Cl. 514—293 4 Claims

1. An imidazoquinolone compound represented by the formula



wherein R^1 represents lower alkyl or $-(CH_2)_mCO-R^3$ where R^3 represents hydrogen, lower alkyl, hydroxy or lower alkoxy; and m is an integer of 1 to 3; R^2 represents lower alkyl; or a pharmaceutically acceptable salt thereof.

5,010,085

BENZO-FUSED CYCLOALKANE AND OXA- AND THIA-CYCLOALKANE TRANS-1,2-DIAMINE DERIVATIVES

Penio Pennev, Chadds Ford, Pa.; Parthasarathi Rajagopalan, and Richard M. Scribner, both of Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

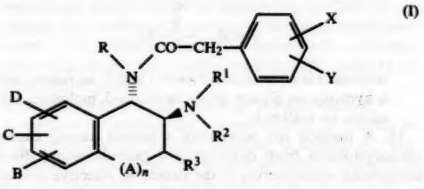
Division of Ser. No. 362,681, Jun. 7, 1989, Pat. No. 4,929,627, which is a division of Ser. No. 71,028, Jul. 16, 1987, Pat. No. 4,876,269, which is a continuation-in-part of Ser. No. 905543, Sep. 10, 1986, abandoned. This application Dec. 21, 1989, Ser. No. 455,882

The portion of the term of this patent subsequent to May 29, 2007, has been disclaimed.

Int. Cl.[5] A31K *31/40;* C07D *221/22, 401/04, 403/04*

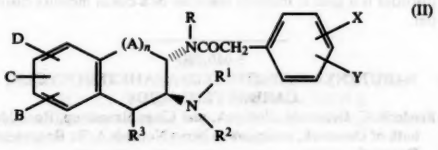
U.S. Cl. 514—299 21 Claims

1. A compound having the formula:



(I)

or



(II)

wherein for the enantiomers and racemic mixtures

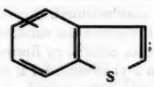
n is 1;

A is —O—, or —S—;

B, C and D independently selected from the group consisting of H, OH, $OCOR^5$, $OCH_2CH_2OR^5$, OR^6, R^6, CH_2OR^6, CH_2COR^7, Cl, F, Br, I, NH_2, NHR^8, NR^8R^9, SH, SR^6, CH_2SR^6 and $OC(S)N(CH_3)_2$;

X and Y independently are selected from the group consisting of H, OCH_3, Cl, F, Br, I, NO_2, CF_3, CN, SO_2R^{10}, and SO_2CF_3 or;

X and Y taken together with the benzene ring form



R is selected from the group consisting of H, and alkyl of 1 to 3 carbon atoms;

R^1 and R^2 are taken together with the nitrogen to which they are attached to be 1-pyrrolidinyl substituted at the 3-position by OH, alkyl of 1 to 3 atoms, alkoxy of 1 to 3 carbon atoms or alkanoyloxy of 1 to 3 carbon atoms; 2,5-dihydro-1H-pyrrol-1-pyrrol-1-yl; 3-azabicyclo[3.1.0-]hexan-3-yl; or 3 azabicyclo[3.2.0]heptan-3-yl;

R^3 is H;

R^5 is alkyl of 1 to 6 carbon atoms, phenyl, or mono-substituted phenyl;

R^6, R^8, R^9, R^{10} and R^{13} are independently an alkyl group of 1 to 3 carbon atoms; and

R^7 is selected from the group consisting of H, OH, OR^{13}, NHR^{13}, and NR_2^{13}; or

a stable N-oxide or a pharmaceutically acceptable salt thereof.

15. A method of treating pain in a mammal comprising administering to the mammal an analgesically effective amount of a compound of claim 1.

5,010,086

IMIDAZOPYRIDINES, COMPOSITIONS AND USE

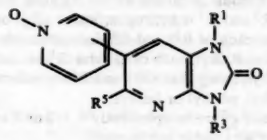
George Y. Lesher, deceased, late of Schodack by Louise E. Lesher, executrix; Edward R. Bacon, East Greenbush; Baldev Singh, East Greenbush, and Gee-Hong Kuo, East Greenbush, all of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Continuation-in-part of Ser. No. 486,637, Feb. 28, 1990, Pat. No. 4,963,561. This application Aug. 7, 1990, Ser. No. 564,011

Int. Cl.[5] C07D *471/04*; A61K *31/44*

U.S. Cl. 514—303 **5 Claims**

1. A compound of the formula



wherein

R_1 and R_3 are hydrogen or lower-alkyl;

R_5 is lower-alkyl or fluorinated lower-alkyl; and the pyridine-N-oxide is attached at the 4- or 3-position; or a pharmaceutically acceptable acid-addition salt thereof.

5,010,087

TRICYCLIC COMPOUNDS AND TXA_2 ANTAGONISTIC COMPOSITIONS THEREOF

Etsuo Oshima, Shizuoka; Hiroyuki Obase, Mishima; Akira Karasawa; Kazuhiro Kubo, both of Shizuoka; Ichiro Miki, Tokyo, and Akio Ishii, Shizuoka, all of Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

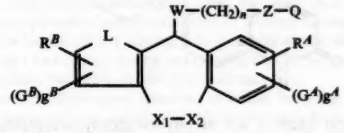
Division of Ser. No. 255,485, Oct. 11, 1988, Pat. No. 4,882,351. This application Jul. 18, 1989, Ser. No. 381,330

Claims priority, application Japan, Oct. 14, 1987, 62-259145

Int. Cl.[5] A61K *31/47, 31/44*; C07D *215/20, 217/26*

U.S. Cl. 514—307 **10 Claims**

1. A tricyclic compound of the formula:



wherein:

X_1—X_2 is selected from the group consisting of —CH_2—O— or

(wherein l represents 0, 1, or 2);

L is selected from the group consisting of —CH=CH— or —S—;

is a single or double bond;

W is selected from the group consisting of —S—, —O—, —NH—, —CH_2—, —NHCO— or =CH—, and the left side of each formula is bound to the tricyclic nucleus;

n is 0,1,2, or 3;

Z is selected from the group consisting of —NR^1CO—, —NR^1SO_2—, —NR^1CONH—, —NR^1CSNH—, —$NR^1NHCONH$—, —$NR^1NHCSNH$—, —NR^1COO— or —NR^1COS—, wherein R^1 is hydrogen or lower alkyl, and the right side of each formula is bound to Q;

Q is selected from the group consisting of optionally substituted, N-substituted or unsubstituted pyrrolyl, (wherein the N-substituent is lower alkyl, phenyl or benzyl), pyridyl, quinolyl or isoquinolyl wherein substitution means 1 to 3 substituents on the aromatic ring, independently selected from lower alkyl, phenyl, benzyl, halogen, trifluoromethyl, nitro, OR^2 or SR^2, (wherein R^2 represents hydrogen, lower alkyl, phenyl or benzyl);

one of R^A and R^B is hydrogen and the other is —Y—M— wherein Y is selected from the group consisting of a single bond, —CR^3R^4—$(CH_2)_m$— and —CR^3=CR^4—$(CH^2)_m$)— and each of R^3 and R^4 are independently hydrogen

or lower alkyl and m is 0, 1, 2, 3, or 4, wherein the left side of each formula is bound to the tricyclic nucleus; M is —$COOR^5$ and R^5 is hydrogen, lower alkyl or —$CONR^{5a}R^{5b}$ and each of R^{5a} and R^{5b} independently are hydrogen or lower alkyl; each of G^A and G^B are independently lower alkyl, halogen or OR^6 and R^6 represents hydrogen, lower alkyl, phenyl or benzyl;

each of g^A and g^B are independently 0, 1, 2 or 3; or a pharmaceutically acceptable salt thereof.

10. A pharmaceutical composition comprising a pharmaceutical carrier and, as an active ingredient, a therapeutically effective amount of a tricyclic compound defined in claim 1.

5,010,088

6-(4-HYDROXYPIPERIDINO) CARBOSLYRIL

Richard M. Welch, Raleigh; Alan R. Brown, Durham, and Arthur P. Phillips, Raleigh, all of N.C., assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

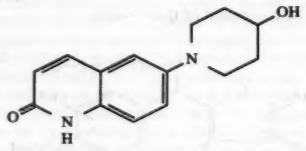
Filed Aug. 24, 1989, Ser. No. 398,219

Claims priority, application United Kingdom, Aug. 25, 1988, 8820174

Int. Cl.[5] C07D *401/04;* A61K *31/47*

U.S. Cl. 514—312 11 Claims

1. The compound of formula (I)



(I)

or an acid addition salt or physiologically acceptable ester thereof.

5,010,089

CCK ANTAGONISTS AND THEIR USE IN TREATING GASTROINTESTINAL DISORDERS

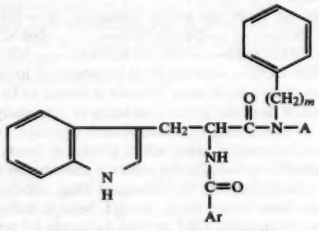
Sun H. Kim, Chestnut Hill, and Sylviane Moreau, Upton, both of Mass., assignors to Biomeasure, Inc., Hopkinton, Mass.

Continuation-in-part of Ser. No. 231,493, Aug. 12, 1988, abandoned, which is a continuation-in-part of Ser. No. 815,217, Dec. 31, 1985, Pat. No. 4,814,463. This application Aug. 21, 1989, Ser. No. 396,567

Int. Cl.[5] C07D *209/18, 403/12;* A61K *31/405, 31/47*

U.S. Cl. 514—314 12 Claims

1. A compound having the formula

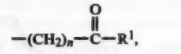


or pharmaceutically acceptable salt thereof,

wherein Ar is an indolyl, quinolyl or naphthyl;

m is an integer between 0 and 2, inclusive; and

A is either



wherein n is an integer between 1 and 5, inclusive, and R^2 is hydroxy, an alkoxy group having 1–5, inclusive, carbon atoms, or aralkoxy.

11. A method for preventing a patient having excessive cholecystokinin from developing a gastrointestinal disorder comprising administering to the patient an effective amount of the compound of any of claim 1–10.

12. The method of claim 11 wherein said gastrointestinal disorder is a gastric motility disorder or a colon motility disorder.

5,010,090

N-(BUTENYL SUBSTITUTED) AZAHETEROCYCLIC CARBOXYLIC ACIDS

Frederik C. Gronvald, Vedbaek, and Claus Braestrup, Roskilde, both of Denmark, assignors to Novo Nordisk A/S., Bagsvaerd, Denmark

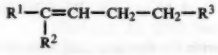
Continuation-in-part of Ser. No. 33,084, Feb. 24, 1987, abandoned. This application Oct. 7, 1988, Ser. No. 254,557

Claims priority, application Denmark, Jun. 26, 1985, 2883/85; Jun. 26, 1986 [DK] Denmark PCT/DK86/00076

Int. Cl.[5] C07D *401/14*

U.S. Cl. 514—326 10 Claims

1. A compound of formula I



I

wherein R^1 and R^2 are the same or different and each represents a substituted or unsubstituted, thien-2-yl, thien-3-yl, pyrrol-2-yl or pyrrol-3-yl wherein the substitution is with at least one of C_{1-7} alkyl, bromo, chloro, or fluoro and at least one of said R^1 and R^2 is thien-2-yl substituted at least at the 3-position or pyrrol-2-yl substituted at least at the 1-position with C_{1-7}-alkyl, chloro, bromo, or fluoro, and wherein R^3 represents 3-carboxypiperidin-1-yl, 3-carboxy-1,2,5,6-tetrahydropyridin-1-yl or 3-carboxymethylpyrrolidin-1-yl, and pharmaceutically acceptable salts thereof.

5,010,091

2,4-DIHALOGENO-6-PYRIDYLETHANOLPHENYLISOPROPYLAMINES FOR SHIFTING THE PROTEIN-FAT RATIO OF ANIMALS IN FAVOR OF PROTEIN

Hans Lindel, Leverkusen; Werner Hallenbach, Monheim; Friedrich Berschauer, Wuppertal; Heinrich Greife, Langenfeld, and Gernot Klotz, Leichlingen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

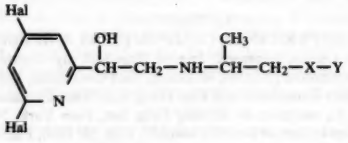
Filed Feb. 8, 1990, Ser. No. 477,272

Claims priority, application Fed. Rep. of Germany, Feb. 18, 1989, 3905028

Int. Cl.[5] C07D *213/61, 213/89;* A61K *31/44*

U.S. Cl. 514—357 8 Claims

1. A 2,4-dihalogeno-6-pyridyl-ethanolamine of the formula



(I)

in which

Hal are identical or different and represent fluorine, chlorine or bromine,

X represents a direct bond of —CH_2— and

Y represents phenyl which is substituted by OH, C_{1-4}-alkoxy, C_{1-4}-alkoxy-C_{1-4}-alkoxy, carboxyl, aminocarbonyl, C_{1-4}-alkoxycarbonyl, hydroxy-C_{1-4}-alkoxy, amino-C_{14}-alkoxy, C_{1-4}-alkoxycarbonyl-C_{1-4}-alkoxy or phenyl-C_1-C_4-alkoxy,

or a physiologically tolerated salt or N-oxide thereof.

8. A method for shifting the protein-fat ratio of animals in favor of protein and for treating adiposity in humans and animals, comprising administering to said animals or humans an amount effective therefor of a compound according to claim 1.

5,010,092

PROTECTION AGAINST CHEMICALLY-INDUCED KIDNEY DAMAGE BY METHIMAZOLE

Adnan A. Elfarra, Madison, Wis., assignor to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Dec. 22, 1989, Ser. No. 454,884

Int. Cl.[5] A01N *43/64, 43/82, 43/78, 43/50*

U.S. Cl. 514—359 **7 Claims**

1. A method for reducing nephrotoxicity of an effective amount of compound A that is being administered to a live mammal in need thereof, where compound A is an antibiotic, the method comprising:

administering to the live mammal the effective amount of the antibiotic and an effective amount of a compound B so as to reduce the nephrotoxicity of the antibiotic;

wherein compound B is selected from the group of methimazole and carbimazole.

5,010,093

NITRIC ESTER DERIVATIVE

Youichi Shiokawa, Ibaraki; Koichi Takimoto, Takarazuka, and Kohei Takenaka, Sakai, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

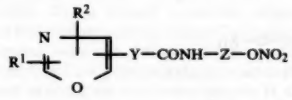
Division of Ser. No. 213,623, Jun. 30, 1988, Pat. No. 4,923,886. This application Mar. 16, 1990, Ser. No. 494,545

Claims priority, application United Kingdom, Jul. 20, 1987, 8717068

Int. Cl.[5] C07D *263/34, 263/32*; A61K *31/42*

U.S. Cl. 514—374 **7 Claims**

1. A compound of the formula:



wherein

R^1 is hydrogen, lower alkyl, halo(lower)alkyl, halogen, phenyl, nitrophenyl, pyridyl, morpholino, piperidino, amino, lower alkanoylamino, higher alkanoylamino, benzamido, lower alkoxycarbonylamino, N-lower alkylamino, N,N-di(lower)alkylamino, N-lower alkyl-N-lower alkanoylamino, 3-lower alkylureido or N,N-di(lower) alkylamino(lower)alkyl,

R^2 is hydrogen, lower alkyl or N-(nitroxy-(lower)alkyl) carbamoyl,

Y is a single bond, lower alkylene or lower alkenylene, and

Z is ethylene, trimethylene, tetramethylene, 1-methylnitroxymethylethylene, 1,1-bis(nitrooxymethyl)ethylene, 2-nitrooxytrimethylene or ethyleneoxyethylene, and pharmaceutically acceptable salts thereof.

5,010,094

IMIDAZOLYL COMPOUNDS AND THEIR USE AS FUNGICIDES

Gerold Schade, Cologne; Albrecht Marhold, Leverkusen, and Wilhelm Brandes, Leichlingen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

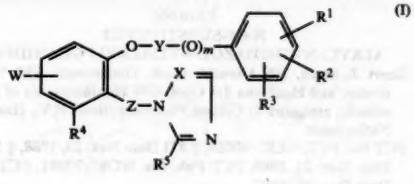
Filed Jan. 18, 1990, Ser. No. 466,805

Claims priority, application Fed. Rep. of Germany, Jan. 21, 1989, 3901723

Int. Cl.[5] C07D *233/60*; A01N *43/50*

U.S. Cl. 514—399 **10 Claims**

1. An axolyl derivative of the formula



(I)

in which

R^1 represents halogenoalkyl having 1 to 4 carbon atoms and 1 to 5 identical or different halogen atoms, or represents halogenoalkylthio having 1 to 4 carbon atoms and 1 to 5 identical or different halogen atoms,

R^2 represents hydrogen, fluorine, chlorine, bromine, cyano, optionally halogen-substituted alkyl having 1 to 6 carbon atoms, optionally halogen-substituted alkenyl having 2 to 6 carbon atoms, alkoxy having 1 to 4 carbon atoms, alkylthio having 1 to 4 carbon atoms, aryl having 6 to 10 carbon atoms or aryloxy having 6 to 10 carbon atoms,

R^3 represents hydrogen, fluorine, chlorine, bromine, cyano, optionally halogen-substituted alkyl having 1 to 6 carbon atoms, optionally halogen-substituted alkenyl having 2 to 6 carbon atoms, alkoxy having 1 to 4 carbon atoms, alkylthio having 1 to 4 carbon atoms, aryl having 6 to 10 carbon atoms or aryloxy having 6 to 10 carbon atoms,

R^4 represents hydrogen,

R^5 represents hydrogen or alkyl having 1 to 4 carbon atoms,

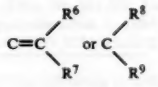
W represents hydrogen, fluorine, chlorine, or bromine,

X represents a CH group,

Y represents a straight-chain or branched alkylene chain having 1 to 6 carbon atoms,

m represents the number 0 or 1 and

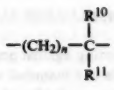
Z represents the grouping



wherein

R^6 represents hydrogen or alkyl having 1 to 4 carbon atoms, or represents phenyl which is optionally substituted by one to three identical or different substituents from the group comprising alkyl having 1 to 4 carbon atoms, halogen and/or halogenoalkyl having 1 or 2 carbon atoms and 1 to 5 halogen atoms, or

R^6, together with R^4, represent the grouping



R^7 represents hydrogen or alkyl having 1 to 4 carbon atoms,

R^8 represents hydrogen or alkyl having 1 to 4 carbon atoms,

R^9 represents hydrogen or alkyl having 1 to 4 carbon atoms,
R^{10} represents hydrogen or alkyl having 1 to 4 carbon atoms,
R^{11} represents hydrogen or alkyl having 1 to 4 carbon atoms and
n represents the number 0, 1, or 2.

9. A method of combating fungi which comprises applying to such fungi or to a fungus habitat a fungicidally effective amount of a compound or addition product thereof according to claim 1.

5,010,095

N-(W-SUBSTITUTED ALKYL)-N'-(IMIDAZOL-4-YL)ALKYL) GUANIDINE

Geert J. Sterk, RN Utrecht; Henk Timmerman, VM Voorschoten, and Henk van der Goot, GW Hoofddorp, all of Netherlands, assignors to Cedona Pharmaceuticals B.V., Haarlem, Netherlands

PCT No. PCT/NL87/00013, § 371 Date Nov. 23, 1988, § 102(e) Date Nov. 23, 1988, PCT Pub. No. WO87/07891, PCT Pub. Date Dec. 30, 1987

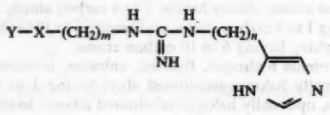
PCT Filed Jun. 19, 1987, Ser. No. 297,549

Claims priority, application Netherlands, Jun. 19, 1986, 8601585

Int. Cl.[5] C07D *233/64*

U.S. Cl. 514—400 **9 Claims**

1. N-(w-substituted alkyl)-N'-[(imidazole-4-yl)alkyl]guanidine of the formula:



wherein
m is 1,2 or 3;
n is 2 or 3;
X is
(a) CH_2, and Y is an R substituted diphenylmethyl group, or X is:
(b) =CH—, and Y is an R-substituted diphenylmethylidene group,
R is a member selected from the group consisting of alkyl, alkoxy, halogen and trihalogen methyl, and the dotted line represents an optional bond, and the acid addition salts thereof.

5,010,096

METHOD OF PROTECTING MAMMALS AGAINST NEURONAL DAMAGE RESULTING FROM CEREBRAL ISCHEMIA

Ann G. Hayes, Potters Bar, and Phillip J. Birch, Biggleswade, both of England, assignors to Glaxo Group Limited, London, England

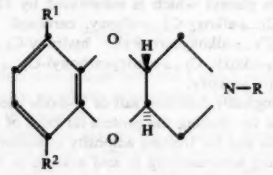
Filed Nov. 30, 1989, Ser. No. 443,189

Claims priority, application United Kingdom, Dec. 1, 1988, 8828032

Int. Cl.[5] A61K *31/40*

U.S. Cl. 514—411 **8 Claims**

1. A method of protecting against neuronal damage resulting from cerebral ischaemia in a mammal which comprises administering to a mammal in need of said protection an effective amount of a compound of formula (I) or a physiologically acceptable salt or hydrate thereof



(I)

wherein
R is a hydrogen atom or a group selected from C_1–C_6alkyl, C_1–C_6alkyl substituted by a C_3–C_7cycloalkyl), C_3–C_6alkenyl, C_3–C_6alkynyl, C_3–C_7cycloakyl aralkyl (in which the alkyl moiety contains 1 to 5 carbon atoms) and CHO;
R^1 is a halogen atom or a group selected from C_1–C_4alkyl, C_1–C_4alkoxy, hydroxyl, cyano, nitro and $—NR^3R^4$;
R^2 is a hydrogen atom, a halogen atom of a group selected from C_1–C_4alkyl C_1–C_4alkoxy, hydroxyl, cyano, nitro and $—NR^3R^4$;
R^3 is a hydrogen atom or a C_1–C_4alkyl group; and
R^4 is a hydrogen atom or a C_1–C_4alkyl group.

5,010,097

NOVEL COMPOUNDS

Roger E. Markwell; Stephen A. Smith; Ian Hughes, and Laramie M. Gaster, all of Harlow, England, assignors to Beecham Pharmaceuticals, Harlow, England

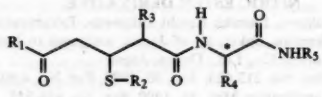
Filed Dec. 20, 1988, Ser. No. 287,453

Claims priority, application United Kingdom, Dec. 22, 1987, 8729804

Int. Cl.[5] A61K *31/16, 31/165;* C07C *323/41*

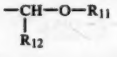
U.S. Cl. 514—419 **12 Claims**

1. A compound of formula (I) or a salt, solvate or hydrate thereof:

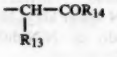


(I)

in which,
R_1 is hydrogen, alkyl, or optionally substituted aryl;
R_2 is hydrogen, or acyl;
R_3 is C_{3-6} alkyl;
R_4 is hydrogen, alkyl, $—CH_2$-R_{10} where R_{10} is optionally substituted phenyl or heteroaryl, or a group



where
R_1 is hydrogen, alkyl, or $—CH_2—$Ph where Ph is optionally substituted phenyl, and R_{12} is hydrogen or alkyl; and
R_5 is hydrogen, alkyl, or a group



where
R_{13} is hydrogen, or alkyl, and R_{14} is hydroxy, alkoxy, or $—NR_6R_7$, where each of R_6 and R_7 is hydrogen or alkyl, or R_6 and R_7 together with the nitrogen atom to which they are bonded form a 5-, 6- or 7-membered ring with an optional oxygen or sulphur atom in the ring or an optional further nitrogen atom optionally substituted by alkyl.

12. A method of treating collagenolytic conditions in mammals which comprises administering an effective amount of a compound of formula (I) as defined in claim 1, or a pharmaceutically acceptable salt, solvate or hydrate thereof to a sufferer.

5,010,098

ARYLPYRROLE INSECTICIDAL ACARICIDAL AND NEMATICIDAL AGENTS AND METHODS FOR THE PREPARATION THEREOF

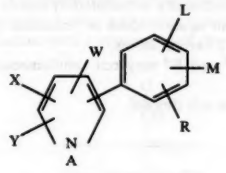
Dale G. Brown, Hunterdon; Jack K. Siddens, Princeton Junction; Robert E. Diehl, Lawrenceville, and Donald P. Wright, Jr., Pennington, all of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 79,545, Jul. 29, 1987, abandoned. This application Jun. 23, 1988, Ser. No. 208,841

Int. Cl.[5] A01N *43/36*

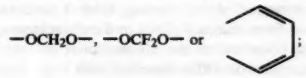
U.S. Cl. 514—426 6 Claims

1. A method for controlling insects, nematodes or acarina comprising: contacting said insects, nematodes or acarina, their infested breeding grounds, food supply or habitat with an insecticidally, nematicidally or acaricidally effective amount of a compound having the structure:



(I)

wherein X is H, F, Cl, Br, I, or CF_3; Y is F, Cl, Br, I, CF_3 or CN; W is CN or NO_2 and A is H; C_1–C_4 alkyl optionally substituted with from one to three halogen atoms, one hydroxy, one C_1–C_4 alkoxy, one C_1–C_4 alkylthio, one phenyl optionally substituted with C_1–C_3 alkyl, C_1–C_3 alkoxy or with one to three halogen atoms, one phenoxy optionally substituted with one to three halogen atoms or one benzyloxy optionally substituted with one halogen substituent; C_1–C_4 carbalkoxymethyl; C_3–C_4 alkenyl optionally substituted with from one to three halogen atoms; cyano; C_3–C_4 alkynyl optionally substituted with one halogen atom; di-(C_1–C_4 alkyl) aminocarbonyl; or C_4–C_6 cycloalkylaminocarbonyl; L is H, F, Cl or Br; and M and R are each independently H, C_1–C_3 alkyl, C_1–C_3 alkoxy, C_1–C_3 alkylthio, C_1–C_3 alkylsulfinyl, C_1–C_3 alkylsulfonyl, cyano, F, Cl, Br, I, nitro, CF_3, R_1CF_2Z, R_2CO or NR_3R_4, and when M and R are on adjacent positions and taken with the carbon atoms to which they are attached they may form a ring in which MR represents the structure:



;

Z is S(O)n or O; R_1 is H, F, CHF_2, CHFCl, or CF_3; R_2 is C_1–C_3 alkyl, C_1–C_3 alkoxy, or NR_3R_4; R_3 is H or C_1–C_3 alkyl; R_4 is H, C_1–C_3 alkyl, or R_5CO; R_5 is H or C_1–C_3 alkyl; and n is an integer of 0, 1 or 2.

5,010,099

DISCODERMOLIDE COMPOUNDS, COMPOSITIONS CONTAINING SAME AND METHOD OF PREPARATION AND USE

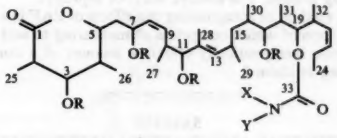
Malika Gunasekera; Sarath P. Gunasekera; Ross E. Longley, all of Vero Beach, Fla., and Neal S. Burres, Highland Park, Ill., assignors to Harbor Branch Oceanographic Institution, Inc., Fort Pierce, Fla.

Division of Ser. No. 392,468, Aug. 11, 1989, Pat. No. 4,939,168. This application May 7, 1990, Ser. No. 519,605

Int. Cl.[5] A61K *31/365*

U.S. Cl. 514—459 3 Claims

1. A method for treating cancerous cachexia caused by the presence of a tumor in a host comprising treating the host with an effective antitumor amount of a compound of the formula:



wherein:

R=—H, —A, —CH_2—Q, —COA, or —COZ,

A=lower alkyl,

Z=phenyl, p-tolyl, m-tolyl, p-bromophenyl, p-chlorophenyl, 3-ethyl-4-bromophenyl, 2,4-diethylphenyl, 2-methyl-3-hydroxyphenyl, 2,4-dimethyl-3-chlorohenyl, 2-bromo-3-amino-4-methylphenyl, and 2-iodo-3-ethyl-5-aminophenyl,

Q=phenyl, tolyl, or xylyl,

X=—H, —A, —Z, or —CH_2—Z, and

Y=—H, —A, —Z, —CH_2—Z, —COA, —COZ, and acid addition salts thereof.

5,010,100

CERTAIN 2,5-DIARYL TETRAHYDROFURANS AND ANALOGS THEREOF AS PAF ANTAGONISTS

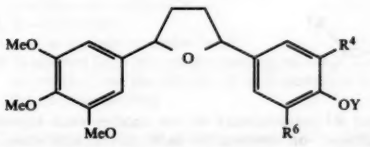
Tesfaye Biftu, Parlin; John C. Chabala, Westfield; Robert L. Bugianesi, Colonia; Mitree M. Ponpipom, Branchburg, and Soumya P. Sahoo, Edison, all of N.J., assignors to Merck & Co. Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 135,862, Dec. 21, 1987, abandoned, which is a continuation-in-part of Ser. No. 852,607, Apr. 16, 1986, abandoned, which is a continuation-in-part of Ser. No. 725,687, Apr. 22, 1985, abandoned, which is a continuation-in-part of Ser. No. 551,666, Nov. 11, 1983, Pat. No. 4,539,332. This application Jun. 8, 1989, Ser. No. 362,919

Int. Cl.[5] C07D *307/04;* A61K *31/34*

U.S. Cl. 514—461 23 Claims

2. A compound of the following structural formula:



(I)

or a pharmaceutically acceptable salt thereof wherein:

R^4 is $S(O)_nR^2$ in which n is 0, 1 or 2 and R^2 is selected from the group consisting of

(a) C_{1-6} alkyl,

(b) C_{2-6} alkenyl,

(c) C_{2-6} alkynyl,

(d) hydroxy-C_{1-6} alkyl,

(e) C_{1-6} alkoxy-C_{1-6} alkyl, and
(f) phenyl-C_{1-6} alkyl;
Y is selected from the group consisting of
(a) C_{1-12} alkyl,
(b) C_{2-6} (halo)$_x$alkyl in which x is 1, 2, 3, 4 or 5,
(c) hydroxy-C_{1-6} alkyl,
(d) C_{1-6} alkoxy-C_{1-6} alkyl,
(e) C_{2-6} alkenyl,
(f) C_{2-6} alkynyl,
(g) phenyl-C_{1-6} alkyl, and
(h) amino-C_{1-6} alkyl;
R^6 is selected from the group consisting of
(a) C_{1-6} alkoxy,
(b) C_{1-6} alkoxyaminocarbonyloxy, and
(c) di-(C_{1-3} alkyl)amino-C_{1-6} alkyl;
wherein the relationship of the substituents at positions 2 and 5 of the tetrahydrofuran includes all stereo isomers, with the proviso that when R^4 and R^6 are both simultaneously sterically hindering groups, Y is methyl, ethyl or n-propyl.

18. A method of antagonising the effects of PAF in a subject in need thereof which comprises administering to said subject a nontoxic therapeutically effective amount of a compound according to claim **2**.

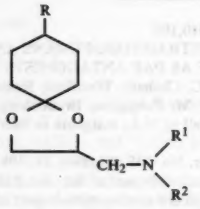
5,010,101

PESTICIDAL AMINOMETHYLHETEROCYCLIC COMPOUNDS

Wolfgang Krämer, Burscheid; Joachim Weissmüller, Monheim; Dieter Berg, Wuppertal; Wilhelm Brandes, Leichlingen, and Stefan Dutzmann, Duesseldorf, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 17, 1989, Ser. No. 395,391
Claims priority, application Fed. Rep. of Germany, Aug. 23, 1988, 3828545
Int. Cl.[5] **A01N** *43/30;* **C07D** *317/72*
U.S. Cl. 514—462 **13 Claims**

1. An aminomethylheterocyclic compound of the formula



(I)

wherein
R represents cycloalkyl having 3 to 7 carbon atoms, or represents aryl which has 6 to 10 carbon atoms and is optionally substituted by one or more identical or different straight-chain or branched alkyl radicals having 1 to 12 carbon atoms, or represents the radical

R^1 and R^2 independently of one another each represent hydrogen, or represent in each case straight-chain or branched alyyl having 1 to 12 carbon atoms, allkenyl having 3 to 8 carbon atoms, alkynyl having 3 to 8 carbon atoms, hydroxyalkyl having 2 to 6 carbon atoms, alkoxyalkyl or dialkoxyalky having in each case 1 to 6 carbon atoms or hydoxyalkoxyalkyl having 2 to 6 carbon atoms in the individual alkyl parts,or represent alkoxycarbonylalky having 1 to 6 carbon atoms per alkoxy and alkyl part, or represent in each case straight-chain or branched dioxolanylalkyl, dioxanylalkyl or oxolanylalkyl having in each case 1 to 4 carbon atoms int he alkyl part, or represent cycloalkyl or cycloalkylalkyl having in each case 3 to 7 carbon atoms in the cycloalkyl part and if appropriate 1 to 4 carbon atoms in the straight-chain or branched alkyl part and in each case optionally substituted in the cycloalkyl part by one or more identical or different substituents selected fromt eh group consisting of halogen and in each case straight-chain or branched alkyl, alkoxy, halogenoalkyl and halogenoalkoxy having in each case 1 to 4 carbon atoms and if appropriate 1 to 9 identical or different halogen atoms; or in additon represent arylalkyl, arylalkenyl or aryl having in each case 6 to 10 carbon atoms in the aryl part and if appropriate up to 6 carbon atoms in the straight-chain or branched alkyl or alkenyl part and in each case optionally substituted in the aryl part by one or more identical or differnt substituents selected from the group consisting of halogen, cyano, nitro and in each case straight-chain or branched alkyl, alkoxy, alkylthio, halogenoalkyl, halogenoalkoxy, halogenoalkylthio, alkoxycarbonyl and alkoximinoalkyl having in each case 1 to 4 carbon atoms in the individual alkyl parts and if approprite 1 to 9 identical or different halogen atoms
R^3 represents hydrogen, or represents straight-chain or branched alkyl having 1 to 12 carbon atoms, or represents aryl which has 6 to 10 carbon atoms and is optionally substitued by one or more identical or differnt straight-chain or branched alkyl radicals having 1 to 12 carbon atoms, and
R^4 represents straight-chain or branched alkyl having 1 to 12 carbon atoms, or represents cycloalkyl having 3 to 7 carbon atoms, or represents aryl which has 6 to 10 carbon atoms and is optionally substituted by one or more identical or different straight-chain or branched alkyl radicals having 1 to 12 carbon atoms,
but wherein R^3 and R^4 may not simultaneously represent methyl,
or an acid addition salt thereof.

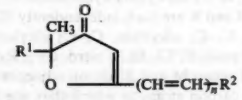
5,010,102

ANTI-ULCER 5-(2-SUBSTITUTED ETHENYL)-3(2H)-FURANONES

Steven W. Felman, Langhorne, Pa.; Ivo L. Jirkovsky, Plainsboro, and Kevin A. Memoli, Cranbury, both of N.J., assignors to American Home Products Corp., New York, N.Y.

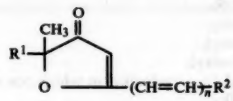
Division of Ser. No. 449,620, Dec. 12, 1989, Pat. No. 4,966,905.
This application Aug. 23, 1990, Ser. No. 572,533
Int. Cl.[5] **A61K** *31/34;* **C07D** *307/02*
U.S. Cl. 514—473 **23 Claims**

1. A compound of the formula:



in which
R^1 is alkyl of 1 to 6 carbon atoms, phenyl or halophenyl;
R^2 is substituted phenyl having from 1 to 3 substituents selected from halo, alkyl of 1 to 6 carbon atoms, alkylthio of 1 to 6 carbon atoms, alkylsulfonyl of 1 to 6 carbon atoms, cyano or trifluoromethyl; and
n is 1 or 2.

22. A method for preventing gastric ulcers which comprises administering, orally or parenterally, to a mammal in need thereof a cytoprotective amount of a compound of the formula:



in which

R^1 is alkyl of 1 to 6 carbon atoms, phenyl or halophenyl;

R^2 is phenyl or substituted phenyl having from 1 to 3 substituents selected from halo, alkyl of 1 to 6 carbon atoms, alkylthio of 1 to 6 carbon atoms, alkylsulfonyl of 1 to 6 carbon atoms, cyano or trifluoromethyl; and

n is 1 or 2.

5,010,103

COMPOSITIONS AND METHODS COMPRISING 2-MERCAPTOMETHYLGLUTARIC ACID DERIVATIVES

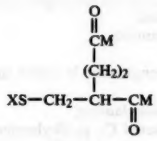
Thomas I. Kalman, East Amherst, N.Y., assignor to The Research Foundation of State University of N.Y., Albany, N.Y.

Division of Ser. No. 58,035, Jun. 4, 1987, Pat. No. 4,927,966. This application Jan. 17, 1990, Ser. No. 466,211

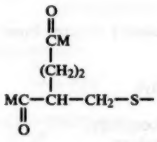
Int. Cl.[5] A61K *31/28;* **C07C** *55/02*

U.S. Cl. 514—495 **15 Claims**

1. A method of complexing a cation selected from the group consisting of amino cation and metal cation comprising contacting said cation with a compound of the formula

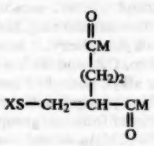


wherein X is selected from the group consisting of hydrogen, R′C— and R″—; R′ is selected from the group consisting of alkyl, alkenyl, alkynyl, substituted and unsubstituted aryl where the substituents are selected from the group consisting of alkyl, alkenyl, alkynyl and aryl; provided that R′ contains no more than 20 carbon atoms; R″ is selected from the group consisting of

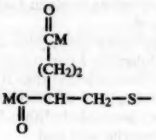


and R′S; M is selected from the group consisting of OR and secondary amine; and R is selected from the group consisting of hydrogen, alkyl, acyloxymethyl, substituted and unsubstituted aryl, amino cation and metal cation selected from the group consisting of alkaline metal, alkaline earth metal, transition metal, gold, platinum and mixtures thereof.

4. A method of inhibiting gamma-glutamyl hydrolases in a warm blooded animal comprising administering to said warm blooded animal an effective gamma-glutamyl hydrolase inhibiting amount of a compound of the formula



wherein X is selected from the group consisting of hydrogen, R′C— and R″—; R′ is selected from the group consisting of alkyl, alkenyl, alkynyl, substituted and unsubstituted aryl where the substituents are selected from the group consisting of alkyl, alkenyl, alkynyl and aryl; provided that R′ contains no more than 20 carbon atoms; R″ is selected from the group consisting of



and R′S; M is selected from the group consisting of OR and secondary amine; and R is selected from the group consisting of hydrogen, alkyl, acyloxymethyl, substituted and unsubstituted aryl, amino cation and metal cation selected from the group consisting of alkaline metal, alkaline earth metal, transition metal, gold, platinum and mixtures thereof.

5,010,104

TRICYCLIC COMPOUNDS

Etsuo Oshima, Shizuoka; Hiroyuki Obase, Mishima; Akira Karasawa; Kazuhiro Kubo, both of Shizuoka; Ichiro Miki, Tokyo, and Akio Ishii, Shizuoka, all of Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

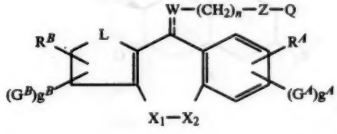
Division of Ser. No. 255,485, Oct. 11, 1988, Pat. No. 4,882,351. This application Jun. 29, 1989, Ser. No. 272,771

Claims priority, application Japan, Oct. 14, 1987, 62-259145

Int. Cl.[5] A61K *31/235, 31/19;* **C07C** *69/616*

U.S. Cl. 514—510 **11 Claims**

1. A tricyclic compound represented by the formula:



wherein:

X_1-X_2 is selected from the group consisting of —CH_2—CH_2— or —CH=CH—;

L is —CH=CH—;

——— is a single or double bond;

W is selected from the group consisting of —S—, —CH_2—, or =CH—, and the left side of each formula is bound to the tricyclic nucleus;

n is 0,1,2 or 3;

Z is selected from the group consisting of —NR^1CO—, —NR^1SO_2— —NR^1CONH—, —NR^1CSNH—, —$NR^1NHCONH$—, —$NR^1NHCSNH$—, —NR^1COO— or —NR^1COS—, wherein R^1 *is hydrogen or lower alkyl, and the right side of each formula is bound to Q;*

Q is selected from the group consisting of straight of branched alkyl having 1 to 18 carbon atoms, alicyclic alkyl having 3 to 6 carbon atoms, lower alkenyl having 2 to 6 carbon atoms and optionally substituted carbocyclic

aryl, optionally substituted aralkyl, aralkenyl, furyl, thienyl, or coumarinyl wherein substitution means 1 to 3 substituents on the aromatic ring, independently selected from lower alkyl, phenyl, benzyl, halogen, trifluoromethyl, nitro, OR^2 and SR^2, wherein R^2 represents hydrogen, lower alkyl, phenyl or benzyl;

one of R^A and R^B is hydrogen and the other is —Y—M— wherein Y is selected from the group consisting of single bond, $—CR^3R^4—(CH_2)_m—$ and $—CR^3{=}CR^4—(CH^2)_m—$ and each of R^3 and R^4 are independently hydrogen or lower alkyl and m is 0, 1, 2, 3, or 4, wherein the left side of each formula is bond to the tricyclic nucleus; M is $—COOR^5$ and R^5 is hydrogen or lower alkyl;

each of G^A and G^B are independently lower alkyl, halogen or OR^6 and R^6 represents hydrogen, lower alkyl, phenyl or benzyl;

each of g^A and g^B are independently 0, 1, 2 or 3; or a pharmaceutically acceptable salt thereof.

11. A compound according to claim **1** which is selected from the group consisting of:

5-[2-[(phenylsulfonyl)amino]ethyl]thio-10,11-dihydro-5H-dibenzo[a,d]cyclohepten-3-carboxylic acid;

5-[2-[(styrylsulfonyl)amino]ethyl]thio-10,11-dihydro-5H-dibenzo[a,d]cyclohepten-3-carboxylic acid;

5-[2-[(phenylsulfonyl)amino]ethyl]thio-5H-dibenzo[a,d]cyclohepten-3-carboxylic acid and

5-[2-[(styrylsulfonyl)amino]ethyl]thio-5H-dibenzo[a,d]cyclohepten-3-carboxylic acid.

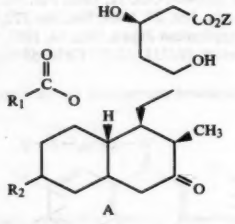
5,010,105

ANTIHYPERCHOLESTEROLEMIC COMPOUNDS

Tu J. Lee, Lansdale, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Filed May 9, 1990, Ser. No. 520,899
Continuation-in-part of Ser. No. 363,816, Jun. 9, 1989, Pat. No. 4,937,259
Int. Cl.[5] A61K *31/21*; C07C *67/02*
U.S. Cl. 514—510 **8 Claims**

1. A compound represented by the structural formulae (I) or (II):



(II)

wherein:

R_1 is:

(1) C_{1-10} alkyl;

(2) substituted C_{1-10} alkyl in which one or more substituent(s) is

(a) halogen,

(b) hydroxy,

(c) C_{1-10} alkoxy,

(d) C_{1-5} alkoxycarbonyl,

(e) C_{1-5} acyloxy,

(f) C_{3-8} cycloalkyl,

(g) phenyl,

(h) substituted phenyl in which the substituents are X and Y,

(i) C_{1-10} alkylS(O)$_n$,

(j) C_{3-8} cycloalkylS(O)$_n$,

(k) phenylS(O)$_n$,

(l) substituted phenylS(O)$_n$ in which the substituents are X and Y, and

(m) oxo;

(n) nitrile,

(o) NR_3R_4,

(p) $CONR_3R_4$;

(3) C_{1-10} alkoxy;

(4) C_{2-10} alkenyl;

(5) C_{3-8} cycloalkyl;

(6) substituted C_{3-8} cycloalkyl in which one substituent is

(a) C_{1-10} alkyl

(b) substituted C_{1-10} alkyl in which the substituent is

(i) halogen,

(ii) hydroxy,

(iii) C_{1-10} alkoxy,

(iv) C_{1-5} alkoxycarbonyl,

(v) C_{1-5} acyloxy,

(vi) phenyl,

(vii) substituted phenyl in which the substituents are X and Y

(viii) C_{1-10} alkylS(O)$_n$,

(ix) C_{3-8} cycloalkylS(O)$_n$,

(x) phenylS(O)$_n$,

(xi) substituted phenylS(O)$_n$ in which the substituents are X and Y, and

(xii) oxo,

(c) C_{1-10} alkylS(O)$_n$,

(d) C_{3-8} cycloalkylS(O)$_n$,

(e) phenylS(O)$_n$,

(f) substituted phenylS(O)$_n$ in which the substituents are X and Y,

(g) halogen,

(h) hydroxy,

(i) C_{1-10} alkoxy,

(j) C_{1-5} alkoxycarbonyl,

(k) C_{1-5} acyloxy,

(l) phenyl, and

(m) substituted phenyl in which the substituents are X and Y;

(7) phenyl;

(8) substituted phenyl in which the substituents are X and Y;

(9) amino;

(10) C_{1-5} alkylamino;

(11) di(C_{1-5} alkyl)amino;

(12) phenylamino;

(13) substituted phenylamino in which the substituents are X and Y;

(14) phenyl C_{1-10} alkylamino;

(15) substituted phenyl C_{1-10} alkylamino in which the substituents are X and Y;

(16) a member selected from the group consisting of:

(a) piperidinyl,

(b) pyrrolidinyl,

(c) piperazinyl,

R_2 is H or CH_3;

R_3 and R_4 are independently selected from:

(a) C_{1-5} alkyl;

(b) substituted phenyl in which the substituents are X and Y;

A is $—CH_2—$;

X and Y are independently selected from:

(a) OH;

(b) halogen,

(c) trifluoromethyl,

(d) C_{1-3}alkoxy,

(e) C_{1-3}alkylcarbonyloxy,

(f) phenylcarbonyloxy,

(g) C_{1-3}alkoxycarbonyl,

(h) phenyloxycarbonyl,

(i) hydrogen,

(j) C_{1-5}alkyl;

Z is selected from

(1) hydrogen;

(2) C_{1-5}alkyl;

(3) substituted C_{1-5} in which the substituent is selected from

(a) phenyl,

(b) dimethylamino, and

(c) acetylamino, and

(4) 2,3-dihydroxypropyl; halogen is Cl or F; n is 0, 1 or 2; or a pharmaceutically acceptable salt thereof.

5,010,106

METHOD OF STERILIZING ANTHERS OF PLANTS

Marat A. Fedin, ulitsa Dm. Ulyanova, 24, kv. 158; Tatyana A. Kuznetsova, Khoroshevskoe shosse, 36b, kv. 62, both of Moscow; Viktor I. Lysenkov, ulitsa Yakubova, 30, kv. 366, Minsk; Svetlana A. Novikova, ulitsa Shirokaya, 19, korpus 2, kv. 176, Moscow; Valentin A. Savchuk, opytnaya stantsia VIR, Poltavskaya oblast, Globinsky raion, selo Ustimovka; Anatoly I. Sedelnikov, ulitsa Turgeneva, 24b, kv. 54, Gorky; Vera P. Shabunya, ulitsa M. Gorkogo, 50, kv. 24; Boris G. Udarov, ulitsa Yakuba Kolasa, 72, kv. 39, both of Minsk; Tatyana S. Tikhonova, ulitsa Aktjubinskaya, 3, kv. 5; Nina P. Polyakova, ploschad Svobody, 4, kv. 85, both of Gorky, and Sergei I. Paklin, ulitsa Malaya Filevskaya, 66, kv. 30, Moscow, all of U.S.S.R.

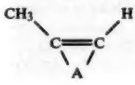
PCT No. PCT/SU88/00062, § 371 Date Nov. 1, 1989, § 102(e) Date Nov. 1, 1989, PCT Pub. No. WO89/08394, PCT Pub. Date Sep. 21, 1989

PCT Filed Mar. 17, 1988, Ser. No. 439,030

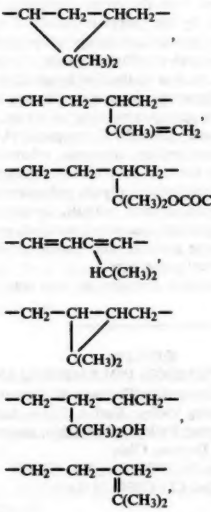
Int. Cl.[5] A01N *27/00, 31/00*

U.S. Cl. 514—546 **11 Claims**

1. A method of sterilizing anthers of plants which comprises applying to said plants with a gametocidally effective amount of a sterilizing agent in combination with a diluent during the period of the fifth and/or sixth stage of organogenesis, said sterilizing agent being a terpenoid compound of the formula:



wherein A =



or mixtures thereof.

5,010,107

METHOD AND COMPOSITION FOR ACHIEVING ANTICARCINOGENIC ACTIVITY

John P. Minton; Thomas E. Webb, and Hussein M. Abou-Issa, all of Columbus, Ohio, assignors to Ohio State University Research Foundation, Columbus, Ohio

Continuation of Ser. No. 89,568, Aug. 26, 1987, abandoned. This application Nov. 13, 1989, Ser. No. 435,543

The portion of the term of this patent subsequent to Apr. 16, 2008, has been disclaimed.

Int. Cl.[5] A61K *31/185*

U.S. Cl. 514—578 **7 Claims**

1. A dietary supplement for inhibiting the formation of mammary cancer cells in humans or animals or for decreasing a patients risk of contracting cancer via steady and prolonged inhibition of β-glucuronidase such that less detoxified toxins are hydrolysed and thus more toxins are excreted and via elevation of the level of cellular cAMP (cyclic AMP) and of histone kinases, comprising approximately 0.01 to 0.02 parts by weight of calcium glucarate for inhibiting β-glucuronidase and approximately 0.0003 to 0.0006 parts by weight of N-(4-hydroxyphenyl) retinamide for elevating levels of cellular cAMP and of histone kinases.

5,010,108

N-CYCLOALKYLAMINOETHYLBENZAMIDE DERIVATIVES, THEIR SYNTHESIS AND PHARMACEUTICAL PREPARATIONS

Stefano Poli; Germano Coppi, and Lucio Del Corona, all of Milan, Italy, assignors to Poli Industria Chimica S.p.A., Milan, Italy

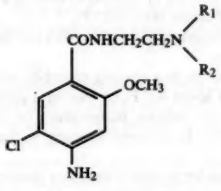
Filed Mar. 15, 1989, Ser. No. 324,596

Claims priority, application Italy, Mar. 17, 1988, 19814 A/88

Int. Cl.[5] C07C *237/44;* A61K *31/165*

U.S. Cl. 514—619 **7 Claims**

1. A N-cycloalkylaminoethylbenzamide derivative having the formula I



(I)

wherein

R_1 is selected from the group consisting of H and C_1–C_4 alkyl groups and

R_2 is cyclopropyl, or a pharmaceutically acceptable salt thereof.

4. A pharmaceutical composition for the treatment of gastritis, gastric trouble, digestion-related headache, digestive problems to menstruation and pregnancy, psychosomatic disturbance in anxious subjects, nausea and vomiting related to slow gastric elimination comprising an effective amount of an N-cycloalkylaminoethylbenzamide derivative selected from the group consisting of -benzamide and 2-methoxy -4-amino-5-chloro-N-2-methoxy-4-amino-5-chloro-N-(2-(cyclopropylamino)- ethyl)-benzamide and 2-methoxy-4-amino-5-chloro-N-(2-(methylcyclopropylamino)-ethyl)-benzamide as the active ingredient in hard and soft gelatin capsules, tablets, drops syrups and vials.

5,010,109

ANTIMICROBIAL AGENT COMPOSITION

Takeshi Inoi, Yokohamashi, Japan, assignor to Chisso Corporation, Japan

Filed May 4, 1989, Ser. No. 347,227
Claims priority, application Japan, Jun. 30, 1988, 63-162983
Int. Cl.[5] A01N *31/00*
U.S. Cl. 514—714 20 Claims

1. An antimicrobial agent composition comprising a zeolite carrier and a saturated monoterpene hydroperoxide as an active ingredient.

5,010,110

WATER ACTIVATED SOLID EMOLIENT PRODUCT AND PREPARATION THEREOF

James M. Wilmott, Kinnelon; William H. Koelle, Morris Plains, both of N.J., and Alexander P. Znaiden, Sloatsburg, N.Y., assignors to Avon Products, Inc., New York, N.Y.

Continuation of Ser. No. 224,194, Jul. 21, 1988, abandoned, which is a continuation of Ser. No. 913,585, Sep. 30, 1986, abandoned, which is a continuation of Ser. No. 774,173, Sep. 9, 1985, abandoned, which is a continuation of Ser. No. 634,853, Jul. 26, 1985, abandoned. This application Apr. 27, 1990, Ser. No. 517,547
Int. Cl.[5] A61K *47/00, 7/025*
U.S. Cl. 514—758 2 Claims

1. The method of forming a stable, self supporting solid bar useful as a cosmetic comprising the steps of:

(a) blending together the following ingredients at a temperature of about 190° F. to form a uniform liquid mixture with all percent weights being based upon the weight of the mixture unless otherwise indicated: about 45 to 65 percent by weight stearyl alcohol, said stearyl alcohol having a C_{18} content of no less than about 97.5% by weight based upon the weight of the stearyl alcohol component, about 1–12 percent by weight sodium stearate, about 15–25 percent by weight emollient comprising one or more alkyl esters selected from the group consisting of isopropyl palmitate, ethyhexyl palmitate, isopropyl isostearate, myristyl myristate, and cetyl lactate, and a solubilizing agent of about 2–12 percent by weight, said solubilizing agent comprising a combination of about 2–6 percent by weight propylene glycol and about 2–6 percent by weight water,

(b) allowing the mixture of step (a) to cool to a temperature in the range of about 160°–165° F.,

(c) pouring the cooled mixture of step (b) into molds to form individual bars,

(d) placing the molds in a cooling chamber maintained at a temperature of about 40° F. or less for a sufficient period of time until the interior temperature of the bars falls below about 95° F. without forming surface blemishes and,

(e) curing the bars for at least 7 days at a temperature of 80° F. or less to form bars characterized by a homogeneous, single phase, crystal/gel structure throughout.

5,010,111

FLAME RESISTANT, EXPANDABLE STYRENE POLYMERS AND FOAMS, AND FLAME RETARDANTS

Klaus Hahn, Kirchheim; Uwe Guhr, Gruenstadt; Hans Hintz, Ludwigshafen; Dietmar Wittenberg, Mannheim, and Peter Gleich, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Aug. 10, 1990, Ser. No. 565,100
Claims priority, application Fed. Rep. of Germany, Aug. 26, 1989, 3928284
Int. Cl.[5] C08J *9/20*
U.S. Cl. 521—56 4 Claims

1. A bead-form, flame-resistant, expandable styrene polymer containing

(a) polystyrene and/or a styrene copolymer containing 50% by weight or more of copolymerized styrene,

(b) from 0.4 to 6% by weight, based on (a), of hexabromocyclododecane having a mean particle size of from 1 to 50 μm, these particles being provided with a firm coating which has a thickness of from 1/100 to 1/10 of the particle diameter and is insoluble in water and in styrene,

(c) from 1 to 10% by weight, based on (a), of an aliphatic C_3- to C_6-hydrocarbon as blowing agent, and, if desired,

(d) customary additives in effective amounts.

5,010,112

METHOD AND APPARATUS FOR IMPROVING THE INSULATING PROPERTIES OF CLOSED CELL FOAM

Leon R. Glicksman, Lynnfield, and Arlene J. Lanciani, Sterling, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Dec. 1, 1989, Ser. No. 444,673
Int. Cl.[5] C08J *9/00, 9/32*
U.S. Cl. 521—76 7 Claims

1. The method of forming a closed cell, rigid foam comprising the steps of:

(a) forming a polymer foam;

(b) forming a non-opaque, non-metallic foam filler dispersed in said polymer foam;

(c) coating said filler with opaque material.

5,010,113

FLAME-RETARDANT POLYURETHANE PRODUCTS

David H. Blount, 6728 Del Cerro Blvd., San Diego, Calif. 92120

Filed Jun. 1, 1989, Ser. No. 360,152
Int. Cl.[5] C08G *18/14*
U.S. Cl. 521—107 21 Claims

1. A flame-retardant polyurethane product which is formed from a mixture comprising:

(A) an amino salt of phosphorus acid selected from the group of compounds produced by reacting a phosphorus acid compound with an amino compound selected from the group consisting of urea, urea-formaldehyde condensate, melamine, melamine-formaldehyde condensate, cyanamide, dicyandiamide, biuret, guanidine, dimethylol urea, ammonium carbamate, urea derivatives, aminoguanidine and mixtures thereof;

(B) a polyol, selected from the group consisting of polyether polyols prepared by the polymerization of epoxides selected from the group consisting of propylene oxide, butylene oxide, tetrahydrofurane oxide, styrene oxide or epichlorohydrin, each with itself or by addition of these or by addition of these epoxides with starting components selected from the group consisting of water, propylene-1,3- or -1,2-glycol, trimethyol propane, 4,4-dihydroxydiphenyl propane, aniline, ammonia, ethanolamine, ethylenediamine and sucrose, polythioether polyols, polyacetals polyols, polycarbonate polyols, polyester amide polyols, hexane polyols, octane polyols, neopentyl polyols, pentaerythritol, quinitol, mannitol, sorbitol, methylglycoside, polybutadiene polyols, and polypropylene polyols modified with vinyl polymers;

(C) a compound which contains at least two isocyanate radicals.

5,010,114

MICROSUSPENSION POLYMERIZATION

Rong-Chang Liang, Centerville; Emerson K. Colyer, Kettering; Jing-Den Chen, Spring Valley; Karl A. Kintz, Kettering, and Chih-Her Suen, Spring Valley, all of Ohio, assignors to The Mead Corporation, Dayton, Ohio

Filed Jan. 16, 1990, Ser. No. 465,299
Int. Cl.[5] C08G *18/14*
U.S. Cl. 521—109.1 17 Claims

1. A method for polymerizing a monomer suspended in water which comprises:

preparing a polymerization mixture of a water immiscible, liquid, ethylenically unsaturated monomer, a polyisocyanate and an oil soluble free radical initiator, dispersing said mixture in a solution of water and a surfactant, and effecting polymerization of said monomer.

5,010,115

SILICONE FOAMS

Bernard F. Grisoni, El Toro, Calif., assignor to Dow Corning France S. A., Valbonne, France

Filed Oct. 16, 1990, Ser. No. 598,526
Claims priority, application France, Oct. 23, 1989, 89 13820
Int. Cl.[5] C08J 9/02
U.S. Cl. 521—154 10 Claims

1. A foamable silicone composition in two or more parts comprising (A) one or more polysiloxanes having not less than , three alkylhydrogensiloxane units per molecule, (B) one or more polysiloxanes having hydroxyl groups, and (C) a platinum catalyst for promoting reaction between the components (A) and (B) wherein at least a major proportion of the polysiloxanes (B) is a polydiorganosiloxane having at least two siloxane units of the formula

$$R_aQ_bSiO_{\frac{(4-(a+b))}{2}}$$

in which R represents a monovalent hydrocarbon group containing 1 to 20 carbon atoms, Q represents a hydroxyl bearing alkylene or oxyalkylene chain, a has the value 0, 1 or 2 and b has the value 1 or 2.

5,010,116

WATER BLOWN FOAM

Ralph Colafati, 46 Knollwood Dr., Branford, Conn. 06405

Filed Jan. 29, 1990, Ser. No. 471,857
Int. Cl.[5] C08G 18/00
U.S. Cl. 521—155 30 Claims

1. A composition useful for producing foam which comprises an oxyalkylated glycerine having hydroxyl number of from about 56 to about 300, an oxypropylated aromatic based mannich condensate, an organic surfactant, an amine catalyst, a polyisocyanate catalyst, and a quaternary ammonium salt or a triazine.

5,010,117

FLEXIBLE POLYURETHANE FOAMS PREPARED USING LOW UNSATURATION POLYETHER POLYOLS

Ronald M. Herrington, Brazoria; Robert B. Turner, Lake Jackson, both of Tex., and Roney J. Matijega, Midland, Mich., assignors to Dow Chemical Company, Midland, Mich.

Filed Jun. 16, 1989, Ser. No. 367,279
Int. Cl.[5] C08G 18/14
U.S. Cl. 521—159 15 Claims

1. A flexible molded or high resiliency slabstock foam which is the reaction product of a reaction mixture comprising a polyisocyanate, an effective amount of a blowing agent and a poly(propylene oxide) polymer having an average nominal functionality from about 2 to about 6, an equivalent weight from about 1000 to about 2000 and a monol content of about 0.04 meq/g or less.

5,010,118

UV CURABLE NON-TOXIC EPOXYSILICONE RELEASE COATING COMPOSITIONS

James L. Desorcie, and Michael J. O'Brien, both of Clifton Park, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jun. 22, 1989, Ser. No. 369,798
Int. Cl.[5] C08F 2/46; C08G 59/22; C08J 3/28
U.S. Cl. 522—31 8 Claims

1. UV curable substantially uniform epoxysilicone compositions convertible to nontoxic release coatings comprising by weight,

(A) 100 parts of epoxysilicone having from 5 to 12 mole percent epoxysiloxy units, based on the total moles of condensed diorganosiloxy units in the epoxysilicone,

(B) 1 to 25 parts of a compatibilizer in the form of a mixture of

(i) 1 to 25 parts of a $C_{(8-20)}$ alkylphenol and

(ii) 0 to 15 parts of a $C_{(4-12)}$ alkanediol, and

(C) an effective amount of a polyarylonium hexafluorometal, or metalloid salt, substituted with at least one nuclear bound alkoxy radical having at least 8 carbon atoms selected from the class consisting of diaryliodonium salts and triarylsulfonium salts.

5,010,119

TERNARY ADHESIVE COMPOSITIONS

Kenneth O. McElrath, Jr., 19515 Suncove La., Humble, Tex. 77346; Martha H. Robertson, Rte. 2, Box 169, Zachary, La. 70791, and Wai Yan Chow, St. Hubertusdreef, 33, Overijse 1900, Belgium

Continuation-in-part of Ser. No. 137,391, Dec. 23, 1981, Pat. No. 4,839,422. This application Nov. 25, 1988, Ser. No. 274,210
Int. Cl.[5] C09J 151/04
U.S. Cl. 523—205 28 Claims

1. A curable adhesive composition having enhanced strength and high temperature resistance, comprising:

(a) a thermoplastic elastomer polymer having grafted thereto a C_3–C_{10} unsaturated mono- or polycarboxylic acid, anhydride or derivative thereof;

(b) a tackifying resin selected from hydrocarbon resins, polyterpene resins, and cyclopentadiene resins; and

(c) a crosslinking agent selected from di- or polyamine hydrocarbyl compounds having from 2 to about 20 carbon atoms, wherein said crosslinking agent is encapsulated with polymer containing maleic anhydride groups.

27. An encapsulated di- or polyamine wherein the encapsulating material is a polymer containing maleic anhydride groups.

5,010,120

SOLID ADHESIVE COMPOSITION

Koji Sugiura, Ichinomiya, Japan, assignor to Sakura Color Products Corporation, Osaka, Japan

Filed Jul. 5, 1990, Ser. No. 548,264
Claims priority, application Japan, Jul. 5, 1989, 1-173715
Int. Cl.[5] C08J 9/32
U.S. Cl. 523—219 7 Claims

1. A solid adhesive composition useful for temporary and repeated fixation of an article on a surface which comprises about 5.0 to about 45 weight percent of an acrylic resin having a glass transition point of −10° C. or below, about 0.1 to about 2.0 weight percent of a polyacrylic acid-based thickening agent, about 5.0 to about 30 weight percent of a fatty acid soap, about 0.1 to about 2.0 weight percent of an alkali hydroxide, about 0.1 to about 10 weight percent of microspheres with an average grain size of about 10 to about 200 μm and about 2.0 to about 60 weight percent of water.

5,010,121

PRODUCTION OF AQUEOUS-BASED FLUOROPOLYMER COMPOSITIONS

Steven G. Yeates, Macclesfield, and John C. Padget, Frodsham, both of England, assignors to Imperial Chemical Industries PLC, London, England

Filed Dec. 7, 1988, Ser. No. 280,879
Claims priority, application United Kingdom, Dec. 10, 1987, 8728884
Int. Cl.[5] C08J 3/00
U.S. Cl. 523—336 19 Claims

1. Process for the preparation of an aqueous-based composi-

tion comprising a fluoropolymer and a vinyl polymer which process comprises:

(1) preparing a non-aqueous solution of a fluoropolymer comprising repeat units A derived from at least one fluorolefine and repeat units B bearing chain-pendant ionic and/or non-ionic disperser groups where such groups impart water-emulsifiability or water-solubility to the fluoropolymer;

(2) converting, by virtue of the effect of said emulsifying or solubilizing disperser groups, the non-aqueous solution of said fluoropolymer formed in step (1) into an aqueous-based emulsion or solution of said fluoropolymer, and

(3) polymerising at least one species of vinyl monomer to form a vinyl polymer in the presence of said aqueous-based emulsion of solution from step (2).

5,010,122

PLASTIC-RUBBER COMPOSITES

Greg Koski, Leominster, Mass., assignor to R.W. Technology, Inc., Cheshire, Conn.

Filed Nov. 2, 1987, Ser. No. 115,901

Int. Cl.[5] C08K *3/02, 5/23;* **C08L** *7/00, 9/00*

U.S. Cl. 524—80 **26 Claims**

1. A thermoplastic composition comprising a vulcanized rubber particulate having a particle size finer than about 10 mesh, a thermoplastic material and at least one coupling agent for adhering to and forming a covalent bond with at least one of said rubber particulate and said thermoplastic material, said rubber particulate and said thermoplastic material being present in a weight ratio in the range of from about 1:9 to about 9:1 and said at least one coupling agent being present in an amount effective to obtain coupling to said at least one of said rubber particulate and said thermoplastic material to about 3% by weight of said at least one of said rubber particulate and said thermoplastic material to be coupled to, and said rubber particulate comprising particulate formed from at least one of ground pneumatic tires, ground liners and ground tubes.

5,010,123

STABILIZER FOR CHLORINE-CONTAINING OLEFIN POLYMERS, A PROCESS FOR ITS PRODUCTION AND POLYMERS CONTAINING THE STABILIZER

Kurt Worschech, Loxstedt; Peter Wedl, Bremerhaven; Erwin Fleischer, Schiffdorf; Frido Loeffelholz, Bremerhaven-Surheide, and Manfred Jaeckel, Loxstedt, all of Fed. Rep. of Germany, assignors to Neynaber Chemie GmbH, Loxstedt, Fed. Rep. of Germany

Filed Apr. 4, 1989, Ser. No. 333,655

Claims priority, application Fed. Rep. of Germany, Apr. 6, 1988, 3811493

Int. Cl.[5] C08K *5/524, 5/10*

U.S. Cl. 524—114 **30 Claims**

1. A stabilizer for chlorine-containing olefin polymers which comprises: a stabilizing effective amount of;

(a) at least one Ca complex of a 1,3-diketone of the formula:

$$[R^1CO—CH=C(R^2)—O—]_x\ Ca(OH)_y$$

wherein R^1 and R^2 may be the same or different and represent radicals selected from the group consisting of C_1–C_4 alkyl, phenyl and phenyl substituted in the p-position, x has a value of 1 to 2 and y has a value of 1 to 0 with the proviso that $x+y=2$,

(b) at least one hydrocarbon wax; and

(c) at least one ester selected from the group consisting of full esters of saturated, straight-chain C_{12}–C_{34} monocarboxylic acids of polyols containing at least 2 carbon atoms and at least 2 hydroxy groups and partial esters of saturated, straight-chain C_{12}–C_{34} monocarboxylic acids of polyols containing at least 2 carbon atoms and at least 2 hydroxy groups which, as a number average, contain at least one free hydroxyl group.

5,010,124

FLOWABILITY IMPROVING AGENT, PROCESS FOR THE PRODUCTION THEREOF AND USE THEREOF

Lars-Inge R. Olsson, Helsingborg, and Kent F. Hamacek, Perstorp, both of Sweden, assignors to Perstorp AB, Perstorp, Sweden

Filed Jan. 30, 1989, Ser. No. 302,941

Claims priority, application Sweden, Jan. 29, 1988, 8800295

Int. Cl.[5] C08K *5/521;* **C08L** *73/00*

U.S. Cl. 524—141 **13 Claims**

1. A flowability improving agent, comprising a combination of (A) a member selected from the group consisting of a sulphonated melamine-formaldehyde resin, a sulphonated melamine-urea-formaldehyde resin and a sulphonated naphthalene-formaldehyde resin, and (B) a compound of the formula

$$Ar\ O—[R_1]_n—R_2$$

where

Ar is a benzene residue or naphthalene residue which may be substituted by a short chain alkyl, R_1 is oxyethylene; $—CH_2CH_2O—$ or oxypropylene;

an oxyethylene chain or an oxypropylene chain with up to fifteen oxyethylene groups or oxypropylene groups or a combination of oxyethylene groups and oxypropylene groups to a chain where the sum of these groups is at most fifteen; the mean value n for n is 1–15 and R_2 is hydrogen or a phosphonate group of the formula

where M_1 and M_2 are hydrogen or alkali metal or where R_2 is a group of the formula

where M_2 has the above meaning and M_3 is $—[R_1]_n—O$ Ar where R_1, n and Ar have the above meanings.

5,010,125

ROOM TEMPERATURE PLAIN PAPER INK

Jurgen M. Kruse, Clinton, and Donald B. Kimball, Jr., Guilford, both of Conn., assignors to XAAR Limited, Cambridge, England

Continuation-in-part of Ser. No. 379,595, Jul. 14, 1989. This application Sep. 20, 1989, Ser. No. 409,753

Int. Cl.[5] C08K *5/15*

U.S. Cl. 524—308 **18 Claims**

1. An ink jet ink composition comprising a colloidal suspension of:

(a) a non-aqueous solvent; and,

(b) dispersed particles which are suspendable in said solvent at room temperature, said dispersed particles comprising a dyestuff dissolved in or bound to a polymer or resin selected from the group consisting of synthetic polymers and natural resins, said polymer or resin being substantially insoluble in water but soluble in said solvent at room temperature, said dyestuff being soluble in or bindable to said polymer or resin at room temperature but substantially insoluble in said solvent at room temperature, and

said polymer or resin being precipitable upon contact with the surface of plain paper, the respective proportions of said solvent, polymer or resin, and dyestuff being selected to provide a fluid ink composition at room temperature.

5,010,126

PROCESS FOR PRODUCING A PETROLEUM WAX COMPOSITION

Richard L. Jones, Ponca City, Okla., assignor to Conoco Inc., Ponca City, Okla.

Division of Ser. No. 278,911, Nov. 30, 1988, Pat. No. 4,965,305. This application Jun. 25, 1990, Ser. No. 543,608

Int. Cl.[5] C08L *91/08*

U.S. Cl. 524—349 **10 Claims**

1. A process for producing a wax composition which comprises:

(a) vacuum distilling a petroleum feed to prepare a 650 distillate heavy intermediate petroleum wax, having a melting point range of from about 155° F. to about 185° F.,

(b) subjecting the heavy intermediate petroleum wax from step (a) to furfural/duosol solvent extraction,

(c) dissolving and crystallizing the heavy intermediate petroleum wax from step (b) from a methyl ethyl ketone/toluene mixed solvent,

(d) dissolving and recrystallizing the heavy intermediate petroleum wax from step (c) from a methyl ethyl ketone/-toluene mixed solvent,

(e) percolating the recrystallized heavy intermediate petroleum wax from step (d) in the molten state through a clay bed; and

(f) blending the recrystallized heavy intermediate petroleum wax from step (e) at from about 50 weight percent to about 90 weight percent with from about 10 weight percent to about 30 weight percent of a polymeric compound selected from the group consisting of ethylene-vinyl acetate copolymer, ethylene-ethyl acrylate copolymer, polypropylene and mixtures there of and having a molecular weight of from about 2,000 to about 100,000 and a melt index of from about 1 to about 250° at 375° F.

5,010,127

ADDITIVE COMPOSITION FOR TREATING WATER USED TO FORM ICE AND METHODS

Michael J. Rzechula, Elizabethtown, Ill., assignor to Slcik Ice Limited, Elizabethtown, Ill.

Filed Sep. 27, 1989, Ser. No. 411,116

Int. Cl.[5] C08K *5/05*

U.S. Cl. 524—379 **17 Claims**

1. An additive for treating water used for forming ice comprising effective ice forming amounts of:

a polymer selected from the group consisting of water gelling starches and polymers of acrylic acid and sodium salt, commonly referred to as super absorbent polymers;

a primary alcohol; and

silicon dioxide.

5,010,128

COMPOSITES OF ETHERIC PHOSPHAZENE AND METAL OXIDES AND THE METHOD OF THEIR FORMATION

Bradley K. Coltrain; Wayne T. Ferrar, both of Fairport, and Christine J. Landry, Honeoye Falls, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 27, 1989, Ser. No. 329,216

Int. Cl.[5] C08G *79/02*; C08J *3/21*; C08K *3/22, 3/34*

U.S. Cl. 524—405 **13 Claims**

1. A process of forming a blended composite comprising combining etheric phosphazene and a metal oxide precursor in a solvent solution, said metal oxide precursor comprises a silicic acid heteropolycondensate prepared by polycondensation of at least one silicon-functional silane of the formula SiX_4 wherein X is hydrogen, halogen, alkoxy, aryloxy, carboxy, or an $—NR_2$ group in which R is hydrogen and/or alkyl and/or aryl with the proviso that not all X are hydrogen, mixing until the etheric phosphazene and metal oxide precursor are dissolved, casting the dissolved materials and curing to recover a blended composite of etheric phosphazene and metal oxide that is not covalently cross-linked between the etheric phosphazene and metal oxide.

5,010,129

PETROLEUM RESISTANT COATING AND METHOD OF PREPARING SAME

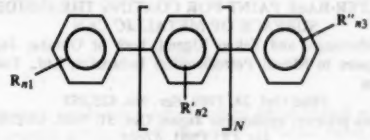
Samir F. Elias, and Daryl K. Morrison, both of Wichita, Kans., assignors to Koch Industries, Inc., Wichita, Kans.

Continuation-in-part of Ser. No. 115,332, Nov. 2, 1987, abandoned. This application Jul. 18, 1988, Ser. No. 221,035

Int. Cl.[5] C08L *31/04*; C08K *3/34*

U.S. Cl. 524—413 **11 Claims**

1. A protective coating comprising an oil-in-water slurry of: 40–60 weight percent water, 15–35 weight percent filler, 0.05 to 1 weight percent of a high molecular weight nonionic surfactant, 1–10 weight percent latex polymer, 10–50 weight percent room temperature solid polyphenyls of the formula:



where

R and R"=H, CH_3 or C_2H_5

R'=H, CH_3, C_2H_5 or phenyl;

n_1 and n_3=1–5

n_2=1–4; and

N=1–4

and 1–6 weight percent compatible plasticizer.

5,010,130

HIGH MELT VISCOSITY FLUOROPOLYMER PROCESS AID

George R. Chapman, Jr., Media, Pa.; Lee A. Gorthey, and Donnan E. Priester, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 15, 1990, Ser. No. 524,260

Int. Cl.[5] C08K *3/36, 3/00*; C08L *23/02, 27/16, 27/18*

U.S. Cl. 524—445 **72 Claims**

1. Improved polymer blend composition having improved processibility and comprising:

(a) a major portion of a difficultly melt-processible polymer, and

(b) a minor portion of:

(1) at least an effective amount, to improve processibility, of a fluorocarbon copolymer which at the melt-processing temperature of (a) is either in a melted form if crystalline, or is above its glass transition temperature if amorphous, and

(2) at least an effective amount, to improve processibility, of at least one tetrafluoroethylene homopolymer or copolymer of tetrafluoroethylene and at least one monomer copolymerizable therewith, wherein the mole ratio of fluorine to hydrogen is at least 1:1, and which is solid at the melt processing temperature of

(a), said composition further characterized in that it contains an abrasive inorganic filler that retards the processibility of (a) in the presence of (b)(1) and (b)(2), the improvement consisting of minimizing the retarding effect of the inorganic filler by employing (b)(1) having an apparent viscosity at 200 C of at least about 400 Pa.s measured at an apparent shear stress of 360 KPa.

5,010,131
BARRIER COATING
Steven D. Wagner, Loveland, Ohio, assignor to Texo Corporation, Cincinnati, Ohio
Filed Oct. 20, 1989, Ser. No. 424,426
Int. Cl.[5] C08K 3/18
U.S. Cl. 524—457 12 Claims

1. An aqueous solution for forming a thermally releasable coating on spray booth surfaces and equipment located in paint spray booths, said coating being easily removable with heated water, said solution comprising,
from about 20%–50% water,
from about 10%–40% filler, said filler being a pigment,
from about 5%–15% film former selected from the group consisting of vinyl acetate copolymer emulsions, sugar, soap, organic salts and polyvinyl alcohol,
from about 1%–10% alkaline source, selected such that said aqueous solution has a pH of greater than 8.0, and
from about 10%–40% blowing agent, said blowing agent comprising citric acid and sodium bicarbonate.

5,010,132
WATER-BASE PAINT FOR COATING THE INSIDE SURFACE OF METALLIC CAN
Akio Morinaga, and Takeo Kigami, both of Ohtake, Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan
Filed Oct. 24, 1989, Ser. No. 425,953
Claims priority, application Japan, Oct. 31, 1988, 63-275494
Int. Cl.[5] C08L 67/02
U.S. Cl. 524—601 10 Claims

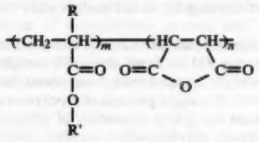
1. A water-base paint for coating the inside surface of a metallic can, said paint comprising fine particles of a polyester resin dispersed in an aqueous medium in the presence of a surface-active agent and being prepared by mixing a solution of the polyester resin in an organic solvent selected from the group consisting of halogenated hydrocarbons and anisole with an aqueous medium containing a surface-active agent with stirring at a high speed to disperse the polyester resin and removing the organic solvent, wherein
(A) the polyester resin comprises units derived from a dicarboxylic acid and units derived from a diol, the units derived from dicarboxylic acid containing units derived from terephthalic acid and units derived from isophthalic acid in a mole ratio of from 10:90 to 80:20, and at least 30 mole % of the units derived from the diol being derived from ethylene glycol,
(B) the surface-active agent is composed of at least one compound selected from the group consisting of alkylaryl sulfonic acid salts, alkylsulfonic acid salts, dialkylsulfosuccinic acid salts, alkylphosphoric acid salts, polyoxyethylene alkylarylether sulfonic acid salts and polyoxyethylene alkylether sulfonic acid salts, and
(C) the fine particles of the polyester resin have an average particle diameter of not more than 3 microns.

5,010,133
POLYURETHANE MOLDING COMPOSITION, METHOD AND ARTICLE
Alan R. Seville, 6422 Watercrest Way, Indianapolis, Ind.
Filed Sep. 29, 1989, Ser. No. 415,499
Int. Cl.[5] C08L 75/04; C08K 3/36
U.S. Cl. 524—871 14 Claims

1. A polyurethane gum material produced by partially reacting a cross-linkable mixture of polyol, polyisocyanate, high activation temperature catalyst and a high surface area filler, the gum material being stable at low temperatures, hand-workable at room temperatures, and capable of being liquified and high pressure molded at elevated temperatures.

5,010,134
ACRYLATE/MALEIC ANHYDRIDE COPOLYMER GRAFTED POLYVINYL ALCOHOL GRAFT TERPOLYMERS
Wen-Yen Chiang, Taipei, and Chun-Min Hu, Keelung, both of Taiwan, assignors to National Science Council, Taipei, Taiwan
Continuation of Ser. No. 259,716, Oct. 19, 1988, abandoned. This application Jul. 30, 1990, Ser. No. 559,094
Int. Cl.[5] C08G 81/02
U.S. Cl. 525—57 12 Claims

1. An acrylate/N-substituted maleimide co-polymer having polyvinyl alcohol units grafted thereto;
said acrylate/N-substituted maleimide co-polymer made by reacting an amine with a homogeneous random acrylate/-maleic anhydride co-polymer having polyvinyl alcohol units grafted to a portion of the maleic anhydride units to form an N-substituted maleamic acid intermediate and then converting the intermediate to form the acrylate/N-substituted maleimide co-polymer having polyvinyl alcohol units grafted thereto;
said acrylate/maleic anhydride co-polymer having polyvinyl alcohol units grafter thereto, comprising 70–30% by weight of polyvinyl alcohol and 30–70% by weight of substantially homogeneous random acrylate/maleic acid co-polymer;
said acrylate/maleic anhydride co-polymer having the following general structure:



where R is hydrogen or methyl;
R′ is C_1–C_4 saturated alkyl group;
m is 30–90 mole percent; and
n is 70–10 mole percent;
said acrylate/maleic anhydride co-polymer having polyvinyl alcohol units grafter thereto, formed by grafting the acrylate/maleic acid co-polymer onto polyvinyl alcohol by a chain-opening esterification reaction between some of the anhydride groups of the maleic anhydride units and some of the hydroxyl groups of the polyvinyl alcohol;
whereby residual hydroxyl and maleic anhydride groups are present in an effective amount for subsequent cross-linking through the action of heat to form interchain ester chain linkages and residual maleic anhydride groups are present in an effective amount for subsequent reaction with the amine to form the acrylate/N-substituted maleimide co-polymer having polyvinyl alcohol units grafted thereto.

5,010,135
MOULDING COMPOUNDS OF AROMATIC POLYESTERS, VINYL COPOLYMERS AND GRAFTED SILICONE RUBBER
Thomas Eckel; Edgar Leitz, both of Dormagen; Dieter Wittmann, Krefeld; Karl-Heinz Ott; Horst Peters, both of Leverkusen, and Jochen Schoeps, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany
Continuation of Ser. No. 292,915, Jan. 3, 1989, abandoned. This application Jun. 29, 1990, Ser. No. 547,384
Claims priority, application Fed. Rep. of Germany, Jan. 12, 1988, 3800603
Int. Cl.[5] C08G 63/48
U.S. Cl. 525—63 9 Claims

1. Thermoplastic moulding compositions comprising
A. from 5 to 98 parts by weight of fully aromatic polyester

synthesized from aromatic C_8–C_{14} dicarboxylic acids and C_6–C_{30} diphenols or aromatic polyester carbonate synthesized from aromatic C_8–C_{14} dicarboxylic acids, C_6–C_{30} diphenols and phosgene,

B. from 2 to 80 parts by weight of a thermoplastic vinyl polymer of

B.1 from 50 to 98 parts by weight of styrene, α-methylstyrene, vinyl toluene, 2,4-dimethyl styrene, methyl methacrylate or mixtures thereof and

B.2 from 50 to 2 parts by weight of acrylonitrile, methacrylonitrile, methyl methacrylate, maleic acid anhydride, N-substituted maleimide or mixtures thereof, and

C. from 1 to 95 parts by weight of a graft polymer of

C.1 from 5 to 90 parts by weight of a monomer mixture of

C.1.1 from 50 to 98 parts by weight of styrene, α-methylstyrene, styrene substituted by halogen, vinyl toluene, 2,4-dimethyl styrene, methyl methacrylate or mixtures of these compounds and

C.1.2 from 2to 50 parts by weight of acrylonitrile, methacrylonitrile, methyl methacrylate, maleic acid anhydride, C_1–C_4-alkyl- or phenyl-N-substituted maleimide or mixtures of these compounds, grafted onto a substrate consisting of

C.2 from 10 to 95 parts by weight of silicone rubber having an average particle diameter of d_{50} of from 0.09 to 1 microns and a gel content of more than 50 percent by weight, based on C.2, derived from

(a) dihalogenated diorganosilane,

(b) from 0 to 10 mol-%, based on (a), of trihalogenated organosilane,

(c) from 0 to 3 mol-%, based on (a), of tetrahalogenated silane and

(d) from 0 to 0.5%, based on (a) of halogenated triorganosilane, in which the organyl groups of compounds (a), (b) and (d) is

(α) C_1–C_6-alkyl or cyclohexyl,

(β) C_6–C_{12}-aryl,

(γ) C_{1-C6}-alkenyl and/or

(δ) mercapto-C_1–C_6 -alkyl,

under the condition that the sum of $(\gamma+\delta)$ is from 2 to 10 mol-%. based on all the organyl groups of compounds (a), (b) and (d), and the molar ration γ:δ is from (3:1) to (1:3).

5,010,136

PROCESS FOR PRODUCING IMPACT-RESISTANT POLYAMIDE RESIN COMPOSITIONS

Tadayuki Ohmae, Chiba; Yoshiki Toyoshima, Ichihara; Kentaro Mashita, Ichihara; Noboru Yamaguchi, Ichihara, and Jinsho Nambu, Chiba, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Aug. 9, 1989, Ser. No. 391,168

Claims priority, application Japan, Aug. 23, 1988, 63-209676

Int. Cl.[5] C08L *77/00*

U.S. Cl. 525—66 **8 Claims**

1. A process for producing an impactresistant polyamide resin which comprises

(1) preparing Mixture (I) by melt-kneading (A) 60 to 20 parts by weight of a polyamide resin with (B) 40 to 80 parts by weight of at least one modified olefin polymer having a glass transition temperature of −10° C. or lower selected from the group consisting of copolymer rubbers of ethylene and an α-olefin having 3 or more carbon atoms which rubbers have 0.01 to 9% by weight of an unsaturated dicarboxylic acid anhydride added thereto ethylene-ethylenically unsaturated ester copolymers having 0.01 to 9% by weight of an unsaturated dicarboxylic acid anhydride added thereto,

(2) preparing Mixture (II) by melt-kneading 100 parts by weight of Mixture (I) with (C) 0.01 to 20 parts by weight of a polyfunctional compound selected from the group consisting of aliphatic diamine carbamates, aliphatic polyamines, alicyclic polyamines and aromatic amines, and

(3) melt-kneading 100 parts by weight of Mixture (II) with (D) 50 to 1,000 parts by weight of a polyamide resin.

5,010,137

RUBBER COMPOSITION, AND OIL SEAL AND RUBBER HOSE OBTAINED THEREFROM

Itsuki Umeda, Tokyo; Masaaki Takashima, Tokyo; Yoshiaki Zama, Tokyo; Yasuhiko Takemura, Tokyo; Yuichi Funabashi, Gunma; Junichiro Watanabe, Gunma; Kiyoshi Takeda, Gunma, and Makoto Matsumoto, Gunma, all of Japan, assignors to Japan Synthetic Rubber Co., Ltd. and Toshiba Silicone Co., Ltd., both of Tokyo, Japan

Filed Feb. 16, 1988, Ser. No. 156,118

Claims priority, application Japan, Feb. 16, 1987, 62-31401; Jul. 17, 1987, 62-177323

Int. Cl.[5] C08L *83/05*

U.S. Cl. 525—104 **8 Claims**

1. A rubber composition obtained by compounding (B) from 0.005 to 50 parts by weight of an polyorgano-hydrogensiloxane and (C) from 0.00001 to 1 part by weight of a compound of a transition metal belonging to the group VIII with (A) 100 parts by weight of a rubber-forming polymer mainly comprising (I) from 3 to 70% by weight of a polyorganosiloxane represented by the formula:

$$R_aSiO_{\frac{4-a}{2}}$$

wherein R represents a substituted or unsubstituted monovalent organic group, 0.02 to 10 mole % of which being a vinyl group; and a represents a number of from 1.900 to 2.004, and having a polymerization degree of from 500 to 10,000 and (II) from 30 to 97% by weight of organic rubber other than (I), and subjecting the resulting composition to hydrosilylation while effecting shear deformation, wherein said composition further comprises a different cross-linking agent for the organic rubber, in addition to component (B), subsequently added.

5,010,138

THERMOPLASTIC INTERPOLYMERS AND THEIR USE IN MIXTURES OF POLYAMIDE AND STYRENE COPOLYMERS AND/OR GRAFT POLYMERS

Uwe Westeppe, Mettmann; Karl-Erwin Piejko, Bergisch-Gladbach, and Christian Lindner, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Fed. Rep. of Germany

Filed Aug. 7, 1989, Ser. No. 389,967

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1988, 3827669

Int. Cl.[5] C08L *77/00*

U.S. Cl. 525—183 **10 Claims**

1. Interpolymers of

(A) from 40 to 80% by weight polyamides with or without partial crystallinity and

(B) from 20 to 60% by weight thermoplastic copolymers or mixtures of several thermoplastic copolymers of (B1) monomers comprising

(B1.1) at least 15% by weight based on (B) of at least one monomer selected from the group consisting of styrenes and α-methylstyrenes which are unsubstituted or substituted by at least one haloalkyl or halogen, and

(B1.2) from 0 to 50% by weight based on (B), of other monomers selected from the group consisting of vinyl acetate, acrylonitrile, methacrylonitrile, and acrylate or methacrylate esters of primary or secondary C_{1-10} alcohols, and

(B2) from 0.5 to 35% by weight based on (B) of at least one ester of acrylic or methacrylic acid with tertiary C_4–C_{10} alcohols

prepared by homogenization of components (A) and (B) in the melt in standard mixing and kneading units at temperatures

above the melting point of the higher-melting component until the interpolymers are formed.

5,010,139

COPOLYMERS OF ETHYLENE OXIDE AS ANTISTATIC ADDITIVES

Simon H. P. Yu, Westlake, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Continuation of Ser. No. 7,039,258, Apr. 17, 1987, abandoned. This application Jun. 14, 1989, Ser. No. 366,330
Int. Cl.[5] C08K 5/15; C08L 9/02, 13/00, 69/00
U.S. Cl. 525—187 6 Claims

1. An antistatic polymeric composition comprising:

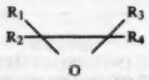
(a) at least one antistatic additive of an ethylene oxide copolymer in the range of from about 3 to about 30% by weight, said antistatic ethylene oxide copolymer being a solid, nonionic material having a dilution solution viscosity of greater than 0.;25 grams per milliliter as determined on a solution made up with 0.25 grams of the polymer in 100 grams of toluene according to ASTM D2857, said copolymer excluding epihalohydrin; and

(b) a polymeric material, excluding olefins, selected from the class consisting of: copolymers of styrene and acrylonitrile; terpolymers of styrene, acrylonitrile and diene rubber; copolymers of styrene and acrylonitrile modified with acrylate elastomers; copolymers of styrene and acrylonitrile modified with ethylene propylene diene monomer rubber; polystyrene; rubber modified impact polystyrene; polycarbonates; thermoplastic polyesters; polyurethane; polyphenylene oxide; polyacetals; polymethyl methacrylate; and mixtures thereof in the range of from about 70 to about 97% by weight,

wherein said ethylene oxide copolymer comprises

(i) ethylene oxide in the range of from about 5 to about 95% by weight; and

(ii) at least one cyclic comonomer represented by the formula:



containing up to 25 carbon atoms, wherein R_1, R_2, R_3, and R_4 are selected from the group consisting of hydrogen, saturated aliphatic and cycloaliphatic, monoolefinic aliphatic and cycloaliphatic, diolefinic (conjugated and non-conjugated) aliphatic and cycloaliphatic, aromatic, aralkyl, and alkaryl groups, and wherein at least one of R_1, R_2, R_3, and R_4 is not hydrogen; said cyclic comonomer in the range of from about 95 to about 5% by weight of the total weight of said ethylene oxide copolymer, said ethylene oxide copolymer having a weight average molecular weight of from about 20,000 to about 5,000,000.

5,010,140

PROCESS FOR PREPARING STABILIZED POLYMER DISPERSION

Joseph A. Antonelli, Riverton, N.J.; Christopher Scopazzi, Wilmington, Del., and Mark M. Doherty, Utica, Mich., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 31, 1989, Ser. No. 363,272
Int. Cl.[5] C08F 2/14, 4/60, 265/06
U.S. Cl. 525—269 6 Claims

1. A process for preparing a stabilized polymer dispersion in an organic liquid in which the principal polymer comprises

(a) a plurality of stabilizer components which are polymers of one or more ethylenically unsaturated acrylic monomers, and

(b) a core component composed of acrylic polymers; substantially all of the stabilizer components being grafted to the core component at one of the stabilizer ends, the process comprising the following steps:

(a) preparing the stabilizer component by polymerizing one of more ethylenically unsaturated acrylic monomers at least one of said monomers containing a reactive functional group, using a catalytic chain transfer agent containing Co^{+2} to form a stabilizer component having an ethylenically unsaturated terminal group and at least one reactive functional group,

wherein the reactive functional group is selected from the group consisting of carboxyl, hydroxy, anhydride, isocyanate amine or silane, and then

(b) preparing the core component by polymerizing one or more acrylic monomers while they are in contact with stabilizer components,

steps (a) and (b) being conducted in an organic liquid which is a solvent for the stabilizer components but a non-solvent for the core component.

5,010,141

REACTIVE SILICONE AND/OR FLUORINE CONTAINING HYDROPHILIC PREPOLYMERS AND POLYMERS THEREOF

Karl F. Mueller, New York, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 427,266, Oct. 25, 1989, Pat. No. 4,463,471. This application Apr. 18, 1990, Ser. No. 510,504
Int. Cl.[5] C08F 259/00, 18/20
U.S. Cl. 525—276 17 Claims

1. A hydrophilic prepolymer containing silicon or fluorine or both silicon and fluorine as well as ethylenically unsaturated groups, which is the reaction product of the random copolymer of, the weight percent amounts of components (A), (B), (C), (D) and (E) being based on the total amount of said components,

(A) 20 to 79.5% by weight of a silicon or fluorine containing vinyl monomer or mixtures thereof,

(B) 79.5 to 20% by weight of N N-dimethyl acrylamide N-vinyl pyrrolidone or N-vinylacetamide or mixtures thereof,

(C) 0.5 to 25% by weight of a vinyl monomer containing an active hydrogen atom or mixtures thereof,

(D) 0 to 30% by weight of an ethylenically unsaturated monomer or mixtures thereof other than a monomer of component (A), (B) or (C),

(E) 0 to 10 mol %, based on the total moles of components (A), (B), (C), (D) and (E) of a chain transfer agent, with

(M_y) 0.2 to 10 mol %, based o the total moles of components (A), (B), (C), (D) and (E), of an ethylenically unsaturated isocyanate.

5,010,142

RUBBER COMPOSITIONS FOR TIRE INNER LINERS

Haruhiro Takano, Odawara, Japan, assignor to The Yokohama Rubber Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 152,823, Feb. 5, 1988, abandoned. This application Oct. 3, 1989, Ser. No. 418,734
Claims priority, application Japan, Feb. 10, 1987, 62-27141
Int. Cl.[5] C08C 19/20
U.S. Cl. 525—332.4 2 Claims

1. A rubber composition for use as an inner lining in automotive tires which comprises a sulfur vulcanizable starting rubber consisting essentially of a halogenated butyl rubber and not including a silicone rubber, and from 0.2 to 2.0 parts by weight per 100 parts of the starting rubber of an accelerator comprising 2-(4'morpholinodithio)benzothiazole.

5,010,143

METHOD FOR PREPARING BLOCK POLYPHENYLENE ETHER-POLYCARBONATES

Thomas L. Evans, Clifton Park; Carol B. Wasserman, Hartsdale; Timothy J. Shea, Schenectady, and John R. Campbell, Clifton Park, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Nov. 23, 1987, Ser. No. 124,127
Int. Cl.[5] C08G 65/48, 69/00, 71/12
U.S. Cl. 525—394 18 Claims

1. A method for preparing a block polyphenylene ether-polycarbonate which comprises preparing a mixture comprising:

(A) at least one cyclic polycarbonate oligomer,

(B) at least one polyphenylene ether wherein all phenolic end groups are in the free phenol form, and

(C) a catalyst for conversion of cyclic polycarbonates to linear polycarbonates, said catalyst being other than a salt of a polyphenylene ether;

and heating said mixture at a temperature in the range of about 175°–350° C.

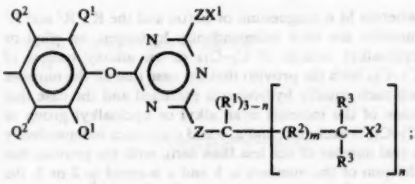
5,010,144

COPOLYMER-CONTAINING COMPOSITIONS FROM SUBSTITUTED TRIAZINE-CAPPED POLYPHENYLENE ETHERS

Ott Phanstiel, IV, Clifton Park, and Sterling B. Brown, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jun. 7, 1990, Ser. No. 534,573
Int. Cl.[5] C08G 65/38; C08L 71/12, 67/00, 77/00
U.S. Cl. 525—397 21 Claims

1. A composition comprising copolymers prepared by the reaction of a polymer containing reactive groups with a substituted alkoxy- or alkylthio-triazine-capped polyphenylene ether having end groups of the formula



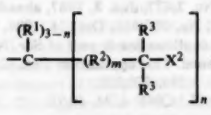
(I)

wherein:

each Q^1 is independently halogen, primary or secondary lower alkyl, phenyl, haloalkyl, aminoalkyl, hydrocarbonoxy, or halohydrocarbonoxy wherein at least two carbon atoms separate the halogen and oxygen atoms;

each Q^2 is independently hydrogen, halogen, primary or secondary lower alkyl, phenyl, haloalkyl, hydrocarbonoxy or halohydrocarbonoxy as defined for Q^1;

X^1 is an alkyl, cycloalkyl or aromatic radical or



(II)

X^2 is a group displaceable by nucleophilic aliphatic substitution;

each Z is independently oxygen or sulfur;

each R^1 is independently hydrogen, C_{1-4} primary or secondary alkyl or a non hydrocarbon substituent substantially inert to displacement by nucleophilic moieties;

R^2 is a C_{1-3} alkylene radical which is unsubstituted or is substituted with moieties selected from the group consisting of C_{1-4} primary or secondary alkyl radicals and non-hydrocarbon substituents as defined for R^1;

each R^3 is independently R^1 or X^2;

m is 0 or 1; and

n is 1—3.

5,010,145

POLYLACTIC ACID FIBER

Yoshito Ikada, and Shokyu Gen, both of Uji, Japan, assignors to Daicel Chemical Industries, Ltd., Sakai, Japan

Filed Apr. 15, 1988, Ser. No. 182,184
Claims priority, application Japan, Apr. 21, 1987, 62-98337
Int. Cl.[5] C08G 63/08; C08L 67/04
U.S. Cl. 525—415 11 Claims

1. A polyactic acid fiber consisting of a blend of from 99 to 1 percent by weight of poly-L-lactic acid and from 1 to 99 percent by weight of poly-D-lactic acid, said fiber being drawn at a temperature of from 100° to 220° C. and a draw ratio of 13 or greater to make the tensile strength of said fiber at least 70 kg/mm^2.

5,010,146

POLYESTER CARBONATE COPOLYMERS, PROCESSES FOR PREPARING SAME AND POLYESTER RESIN COMPOSITIONS CONTAINING SAID COPOLYMERS

Masaki Kohsaka; Isaburou Higashi; Yoshinori Akana; Mikio Hashimoto, and Tadao Yatsu, all of Yamaguchi, Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Jun. 14, 1989, Ser. No. 365,687
Claims priority, application Japan, Jun. 16, 1988, 63-149129
Int. Cl.[5] C08L 69/00, 67/02
U.S. Cl. 525—439 2 Claims

1. A polyester resin composition comprising (i) 50–10 parts by weight of polyalkylene terephthalate, (ii) 50–90 parts by weight of polycarbonate (provided (i)+(ii)=100 parts by weight) and (iii) 3–50 parts by weight, based on 100 parts by weight of the sum total of (i) and (ii), of a polyester carbonate copolymer, said polyester carbonate copolymer (iii) being a polyester carbonate copolymer obtained by polymerization of a mixture of 20–80% by weight of an alkylene terephthalate oligomer [I] containing ethylene terephthalate as main structural units and having an intrinsic viscosity [η], as measured at 25° C. in o-chlorophenol, of less than 0.6 dl/g and 20–80% by weight of a carbonate oligomer [II] containing 2,2-bis(4-hydroxyphenyl)propane as main structural units and having an intrinsic viscosity [η], as measured at 25° C. in o-chlorophenol, of less than 0.6 dl/g, and said copolymer having an intrinsic viscosity [η], as measured at 25° C. in o-chlorophenol, of 0.4–1.2 dl/g and a glass transition temperature (Tg) of 80°–140° C. with a single peak.

5,010,147

HIGH-STRENGTH POLYCARBONATE MIXTURES

Uwe Westeppe, Remscheid; Günther Weymans, Leverkusen; Ulrich Grigo, Kempen; Karsten-Josef Idel, and Dieter Freitag, both of Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 26, 1990, Ser. No. 471,183
Claims priority, application Fed. Rep. of Germany, Feb. 1, 1989, 3902916; Oct. 26, 1989, 3935639
Int. Cl.[5] C08L 69/00
U.S. Cl. 525—462 4 Claims

1. Mixtures containing

(a) 5 to 70% by weight polycarbonate based on 2-(4-hydroxyphenyl)-2-(3-hydroxyphenyl)-propane and

(b) 95 to 30% by weight polycarbonate based on bis-2,2-(4-hydroxy-3,5-dimethylphenyl)-propane,

the sum of the percentages by weight of components (a)+(b) being 100% by weight.

5,010,148

FLAME RETARDANT AROMATIC POLYCARBONATE COMPOSITIONS

Larry N. Lewis, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Aug. 28, 1989, Ser. No. 399,095
Int. Cl.[5] C08F 283/02
U.S. Cl. 525—464 4 Claims

1. Flame retardant halogen-free aromatic polycarbonate composition comprising:

(A) an aromatic polycarbonate resin, and

(B) an amount of a silicate resin which is effective for imparting flame retardance to the halogen-free aromatic polycarbonate composition, where the silicate resin has from 1 to 2 moles of condensed triorganosiloxy units selected from the class consisting of trimethylsiloxy and dimethylphenylsiloxy units, and from 0.15 mole to 1 mole of condensed diorganosiloxy units selected from the class consisting of methylvinylsiloxy units divinylsiloxy units and dimethylsiloxy units, per mole of SiO_2 units.

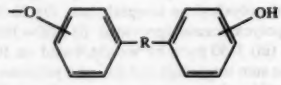
5,010,149

CAN INTERIOR COATING COMPOSITION

Kaoru Morita, and Atsushi Shioda, both of Hiratsuka, Japan, assignors to Kansai Paint Co., Ltd., Amagasaki, Japan

Filed Nov. 6, 1989, Ser. No. 448,326
Claims priority, application Japan, Nov. 11, 1988, 63-283773
Int. Cl.[5] C08F 283/00; C08G 8/28; C08L 61/00, 61/06
U.S. Cl. 525—481 4 Claims

1. A can interior coating composition which contains (A) a modified bisphenol based epoxy resin formed by introducing at least one of a functional group represented by the following formula:



where R is a bivalent aliphatic hydrocarbon group having 1 to 4 carbon atoms, into a molecular terminal of a bisphenol based epoxy resin having an epoxy equivalent of 180 to 7,000 and a number average molecular weight of 350 to 10,000, and (B) a resol phenol resin obtained by reacting the modified bisphenol based epoxy resin (A) with at least one formaldehyde in the presence of a basic catalyst.

5,010,150

CONTROLLING THE PARTICLE SIZE IN THE PREPARATION OF POLYMER POWDERS

Karl Hennig, Hessheim; Heinrich Hartmann, Limburgerhof, and Hans-Juergen Raubenheimer, Ketsch, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Nov. 13, 1989, Ser. No. 434,183
Claims priority, application Fed. Rep. of Germany, Dec. 15, 1988, 3842184
Int. Cl.[5] C08F 2/34; C08J 3/12
U.S. Cl. 526—88 1 Claim

1. A method for controlling the particle size in the preparation of hydrophilic polymer powders by polymerization of water-soluble monoethylenically unsaturated monomers in a powder bed in the presence of a polymerization initiator and an inert auxiliary liquid while maintaining the powder state, removing the heat of polymerization by distilling off the auxiliary liquid and circulating the reaction material, which comprises dividing a solution of the monomers in the inert auxiliary liquid into fine drops with the aid of a multimaterial nozzle which dips into the powder bed, and an inert gas stream, and regulating the particle size of the resulting polymer powder by varying the amount of inert gas in the range from 10 to 100 l per l of monomer solution.

5,010,151

METHOD FOR PREPARING ETHYLENE POLYMERS

Norio Tomotsu, Ichihara, Japan, assignor to Idemitsu Petrochemical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 314,173, Feb. 23, 1989, abandoned, which is a continuation of Ser. No. 130,020, Dec. 8, 1987, abandoned. This application Sep. 11, 1990, Ser. No. 581,196
Claims priority, application Japan, Dec. 10, 1986, 61-292462
Int. Cl.[5] C08F 4/24, 10/02
U.S. Cl. 526—105 16 Claims

1. A method for preparing an ethylene polymer which comprises polymerizing ethylene, or ethylene and at least one α-olefin other than ethylene, at a temperature in the range of from 40° to 150° C., and at a pressure in the range of 1 to 100 kg/cm^2G, in the presence of a composite catalyst, which catalyst consists essentially of:

(A) a solid composition prepared by depositing at least one chromium compound and at least one magnesium compound onto silica and then calcining the resulting solid, the at least one chromium compound deposited onto the silica being an amount corresponding to a chromium content of from 0.05 to 5% by weight of the total chromium atoms based on the sum of the weight of the silica and that of the total chromium compound, the magnesium compound being selected from the group consisting of a magnesium halide, magnesium hydroxide and magnesium acetate, and the molar ratio of the at least one magnesium compound to the at least one chromium compound being from 0.1 to 10; and

(B) a mixture of an alkylmagnesium and an alkylborane each of which is being represented by the following general formula:

$$MR^1_aR^2_bR^3_c$$

wherein M is magnesium or boron and the R^1, R^2 and R^3 moieties are each independently hydrogen, an alkyl or cycloalkyl radical of C_1–C_{14} or an alkoxy radical of C_1–C_{14} with the proviso that the case that all the moieties are each equally hydrogen is excluded and the case that none of the moieties is an alkyl or cycloalkyl group of C_1–C_{14} is excluded; and a, b and c are each independently a real number of not less than zero, with the proviso that the sum of the numbers a, b and c is equal to 2 or 3, the molar ratio of the alkylmagnesium to the alkylborane being from 0.1 to 20, and the molar ratio of the mixture of alkylmagnesium and the alkylborane to the at least one chromium compound being from 2 to 200.

5,010,152

POLYMERIZATION PROCESS UTILIZING CHROMIUM ON AN ACID AGGLOMERATED REFRACTORY GEL

Max P. McDaniel; Emory W. Pitzer, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Continuation of Ser. No. 2,477, Jan. 8, 1987, abandoned, which is a division of Ser. No. 685,411, Dec. 24, 1984, Pat. No. 4,659,690, which is a continuation-in-part of Ser. No. 565,070, Dec. 23, 1983, abandoned. This application Oct. 12, 1989, Ser. No. 420,809
Int. Cl.[5] C08F 4/24, 10/00
U.S. Cl. 526—106 31 Claims

1. A polymerization process comprising contacting at least one mono-1-olefin having 2 to 8 carbon atoms per molecule with a catalyst produced by a method comprising:

(a) combining an acidic composition in a hydrophillic liquid polar organic compound with a precalcined, solid particulate refractory material to provide a workable mixture of liquid and solids, wherein said liquid polar organic compound is employed in an amount in the range of 0.1 to 2

times the total volume of the voids and pores in said refractory material;

(b) working said mixture until voids in the refractory material are reduced and agglomeration of the solid particles occurs; and

(c) drying the thus worked material,

the resulting material having a catalytic amount of a chromium compound incorporated therewith.

5,010,153

COPOLYMERS OF VINYL ACETATE AND FLUORINE-CONTAINING ACRYLATE MONOMERS

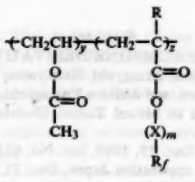
Amir F. Famili, Schnecksville; F. Lennart Marten, Macungie, both of Pa., and Dillip K. Mohanty, Mount Pleasant, Mich., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Continuation-in-part of Ser. No. 202,618, Jun. 3, 1988, abandoned, which is a continuation of Ser. No. 68,866, Jul. 1, 1987, abandoned. This application Apr. 25, 1990, Ser. No. 514,484

Int. Cl.[5] C08F 12/30, 20/22

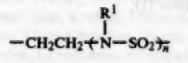
U.S. Cl. 526—243 17 Claims

1. A vinyl acetate copolymer comprising the following general structure:



wherein R is hydrogen or methyl;

X is



wherein R^1 is a C_1-C_4 alkyl group and n is 0 or 1;

R_f is a perfluoroalkyl or perfluoro poly(alkyleneoxy) group;

m is 0 or 1;

y is 50–99.999 mole %; and

z is 0.001–50 mole %.

5,010,154

STABILIZED METAL DRIER

Christopher J. Hardiman, Belchertown, Mass., assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 88,915, Aug. 24, 1987, Pat. No. 4,839,325. This application Mar. 6, 1989, Ser. No. 318,992

Int. Cl.[5] C08F 4/26

U.S. Cl. 526—135 18 Claims

1. A coating composition comprising

(a) a free-radical polymerizable compound and

(b) a fatty acid metal drier reversibly inhibited to catalyzing free radical polymerization by a compound selected from the group consisting of fluoro β-diketones and fluoro β-ketoesters.

5,010,155

VINYL-URETHANE SUBSTITUTED HYDROXYETHYL CELLULOSE

Karl F. Mueller, New York, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 250,199, Sep. 28, 1988, abandoned. This application Mar. 9, 1990, Ser. No. 491,146

Int. Cl.[5] B05D 3/02, 3/12; B32B 27/00, 27/40

U.S. Cl. 527—301 5 Claims

1. Vinyl functional hydroxyethyl cellulose, HEC-V, which comprises hydroxyethyl cellulose, HEC, of at least 10000 MW, in which 0.5–5% of the hydroxy groups have been reacted with a vinyl functional isocyanate, V.

5,010,156

ORGANOSOLV LIGNIN-MODIFIED PHENOLIC RESINS AND METHOD FOR THEIR PREPARATION

Phillip M. Cook, Kingsport, and Steven L. Hess, Mount Carmel, both of Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 197,783, May 23, 1988, abandoned. This application Mar. 12, 1990, Ser. No. 491,802

Int. Cl.[5] C08H 5/02

U.S. Cl. 527—403 14 Claims

1. A method for forming an organosolv lignin-phenol-formaldehyde resin comprising:

(a) mixing particulate wood material, polar organic solvent, and an acid catalyst under heat and pressure to form a pulping liquor;

(b) reducing the concentration of the polar organic solvent in the pulping liquor so that an organosolv lignin precipitates from the pulping liquor and is recovered;

(c) reacting an aqueous alkaline solution of said organosolv lignin with either phenol or formaldehyde to form a reaction product of lignin and either phenol or formaldehyde; and

(d) then reacting the reaction product thus formed with either formaldehyde or phenol, whichever of these two was not used in reaction step (c), to form the organosolv lignin-phenol formaldehyde resin,

wherein the proportion of phenol to lignin in the reaction is from about 0.25:1 to about 3:1 by weight, and the proportion of the formaldehyde to phenol in the reaction is from about 0.25:1 to about 1.5:1 by weight.

5,010,157

PROCESS FOR PREPARING ORGANOSILAZANES

Mannarsamy Balasubramanian, and Pranab Choudhury, both of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Filed Jun. 30, 1989, Ser. No. 374,665

Int. Cl.[5] C08G 77/06

U.S. Cl. 528—14 6 Claims

1. A process which comprises heating at a temperature of at least about 40° C. in a dry atmosphere a composition consisting of an organosilazane solution which is the total reaction mixture resulting from the ammonolysis of an organohalosilane in an organic solvent, the heating being continued until the molecular weight of the organosilazane is increased.

5,010,158

PROCESS FOR PREPARING POLYSILOXAZANE COMPOSITIONS AND THE PRODUCTS FORMED THEREBY

Christian Colombier, Lyon, and Jean-Pierre Cuer, Francheville le Haut, both of France, assignors to Atochem, Puteaux, France

Filed Dec. 23, 1988, Ser. No. 289,645

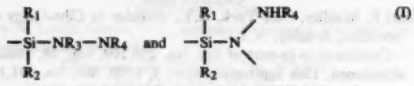
Claims priority, application France, Dec. 28, 1987, 87 18215

Int. Cl.[5] C08G 77/04

U.S. Cl. 528—28 21 Claims

1. Polysiloxazane polymer compositions comprising:

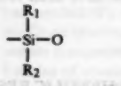
(a) units selected from the group consisting of



(I)

and mixtures thereof; and

(b) units of formula



(II)

wherein R_1, R_2, R_3 and R_4, which may be identical or different is a radical selected from the group consisting of a hydrogen atom, a saturated aliphatic hydrocarbon radical, an alicyclic radical and mono- or polycyclic aryl, alkylaryl and arylalkyl radicals, wherein R_1 and R_2 do not simultaneously denote a hydrogen atom and wherein the molecular mass of said polysiloxazane is greater than 350.

5,010,159

PROCESS FOR THE SYNTHESIS OF SOLUBLE, CONDENSED HYDRIDOSILICON RESINS CONTAINING LOW LEVELS OF SILANOL

Howard M. Bank, Freeland; Martin E. Cifuentes, and Theresa E. Martin, both of Midland, all of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Sep. 1, 1989, Ser. No. 401,726

Int. Cl.[5] C08G *77/06*

U.S. Cl. 528—23 **38 Claims**

1. A method of hydrolyzing a silane of the formula H_aSiX_{4-a} where a is 1 or 2 and X is a hydrolyzable group, to produce polymers containing units of the formula $H_aSiO_{(4-a)/2}$, the method comprising:

forming a hydrolysis medium containing an arylsulfonic acid hydrate.

adding a the silane to the agitated hydrolysis medium,

facilitating hydrolysis of the silane in the hydrolysis medium to form the polymer,

settling the hydrolysis medium and polymer into immiscible layers comprising an acid layer and an organic layer where the organic layer contains the polymer,

separating the organic layer from the acid layer,

contacting the organic layer with a neutralizing agent sufficiently basic to neutralize the remaining acid species but insufficiently basic to catalyze rearrangement of the polymer or solvolysis of silicon hydrides, and

separating the organic layer from the neutralizing agent.

5,010,160

PROCESS FOR PREPARING NOVEL DIAMINES

George P. Speranza, Austin; Jiang-Jen Lin, Round Rock, and Michael Cuscurida, Austin, all of Tex., assignors to Texaco Inc., White Plains, N.Y.

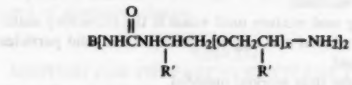
Division of Ser. No. 78,309, Jul. 27, 1987, Pat. No. 4,906,774. This application Oct. 30, 1989, Ser. No. 430,686

Int. Cl.[5] C08G *18/80*

U.S. Cl. 528—45 **2 Claims**

1. A flexible poly(urethane)(urea) coating prepared by reacting

(a) a urea-linked polyoxyalkylene diamine having the following general structure:



where B represents an alkyl nucleus structure from a diisocyanate from the group consisting of isophorone diisocyanate, 1-6-hexamethylene diisocyanate or tetramethylxylene diisocyanate, R' is hydrogen or methyl, and x is a number having an average value of about 1 to 60, with

(b) a blocked isocyanate prepolymer prepared from a polyol from the group consisting of trimethylolpropane, toluene diisocyanate and methyl ethyl ketone oxime, in the presence of an organic solvent and at an elevated temperature,

the improvement comprising improved storage stability and compatibility of component (a) and (b).

5,010,161

POLYALDIMINE DERIVATIVES

Masaaki Aoki, Zusi; Masayuki Kamiyama; Kiyotsugu Asai, both of Yokohama, and Akihiro Yamaguchi, Kamakura, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

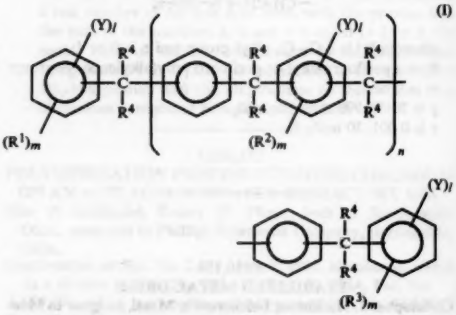
Filed Dec. 19, 1989, Ser. No. 452,583

Claims priority, application Japan, Dec. 21, 1988, 63-320582; Dec. 21, 1988, 63-320584

Int. Cl.[5] C08G *18/10*

U.S. Cl. 528—59 **25 Claims**

1. A poly(phenylenebisalkylene)poly(phenylaldimine) represented by the formula (I):



(I)

wherein R^1, R^2 and R^3 are a halogen atom, hydrogen atom, alkoxy group having 4 or less carbon atoms or an alkyl group having 5 or less carbon atoms, and may be the same or different; R^4 is a hydrogen atom or a methyl group; Y is —N=CH—$C(R^5)_3$ or —N=CH—$C(CH_3)_2$—CH_2 —O—CO—R^6 wherein R^5 is an alkyl group having 4 or less carbon atoms, R^6 is an alkyl group, anilino group, benzylamino group or an alkylamino group having 16 or less carbon atoms; and l is an integer of 1 or 2, m is an integer of 1 to 3, and n is an integer of 0 to 300.

5,010,162

POLYCARBONATE OF ALKYL CYCLOHEXYLIDENE BISPHENOL

Volker Serini; Dieter Freitag, both of Krefeld; Uwe Westeppe, Mettmann; Karsten Idel, Krefeld; Ulrich Grigo, Kempen; Carl Casser, Cologne; Klaus-Christian Paetz, Burscheid, and Manfred Hajek, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

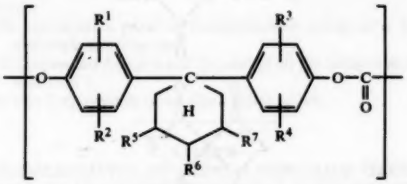
Filed Dec. 19, 1989, Ser. No. 452,874

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1988, 3843560; Aug. 12, 1989, 3926719

Int. Cl.[5] C08G 64/06

U.S. Cl. 528—196 3 Claims

1. A moulding composition comprising a thermoplastic aromatic polycarbonate resin having a weight average molecular weight of at least 10,000 comprising bifunctional carbonate structural units corresponding to



in which

R^1, R^2R^3 and R^4 independently of one another represent hydrogen, a C_1–C_{12} hydrocarbon radical, halogen and

R^5, R^6 and R^7 represent hydrogen, iso-C_3–C_5-alkyl, one of the substituents R^5, R^6 or R^7 being other than hydrogen, in quantities of from 100 to 1 mol-%, based on the total quantity of difunctional carbonate structural units in the polycarbonate.

5,010,163

POLYCARBONATE OF CYCLOALKYLIDENE BISPHENOL

Volker Serini; Dieter Freitag, both of Krefeld; Uwe Westeppe, Mettmann; Karsten Idel, Krefeld; Ulrich Grigo, Kempen; Carl Casser, Cologne; Klaus-Christian Paetz, Burscheid-Hilgen, and Manfred Hajek, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Bayerwerk, Fed. Rep. of Germany

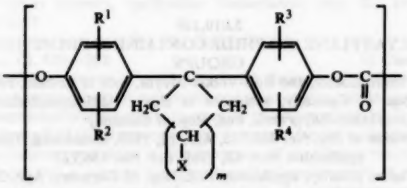
Filed Dec. 13, 1989, Ser. No. 450,604

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1988, 3842944; Aug. 12, 1989, 3926766

Int. Cl.[5] C08G 64/06

U.S. Cl. 528—196 3 Claims

1. A molding composition comprising a thermoplastic aromatic polycarbonate resin having a weight average molecular weight of at least 10,000 comprising bifunctional carbonate structural units corresponding to



in which

R^1, R^2, R^3, and R^4 independently of one another represent hydrogen, a C_1–C_{12} hydrocarbon radical, halogen,

m is 2 or 3 and

X is hydrogen or a C_6–C_{12} hydrocarbon radical, at least one substituent X being a C_6–C_{12} hydrocarbon radical,

in quantities of from 100 to 1 mol-%, based on the total quantity of difunctional carbonate structural units in the polycarbonate.

5,010,164

PROCESS FOR FORMING UREA-FORMALDEHYDE RESIN AND USE

Wolf D. Schollhorn, Jakobstrasse 29, 6718 Grunstadt, Fed. Rep. of Germany

Continuation of Ser. No. 297,517, Dec. 5, 1988, abandoned. This application May 7, 1990, Ser. No. 519,751

Claims priority, application Fed. Rep. of Germany, Dec. 8, 1987, 37414380

Int. Cl.[5] C08G 4/00

U.S. Cl. 528—243 14 Claims

1. A process for making strongly exothermally setting urea-formaldehyde resin, obtained by condensation of urea with formaldehyde under alkaline, comprising the steps of:

(a) condensing, in a first condensation step, 0.2 to 0.7 moles of urea with 1.2 to 3 moles of formaldehyde in the form of solid paraformaldehyde, under exclusively alkaline conditions, at a spontaneously establishing initial pH of 8 to 12, in the presence of one of (i) 1 to 10 mmoles of NaOH and 10 to 80 mmoles of NH_3, and (ii) 2.5 to 50 mmoles of guanidine base and 0 to 80 mmoles of NH_3, per 1 mole of formaldehyde at a condensation temperature of 90 to 110° C., for a condensation time of 10 to 100 minutes; and

(b) adding, in a second condensation step, 0.2 to 0.7 moles of urea, at a condensation temperature pb 100 to 120° C., for a further condensation time of 1.5 to 5 hours.

5,010,165

DIMENSIONALLY STABLE POLYESTER MELT BLOWN WEB

Wayne P. Pruett; Max F. Meyer, Jr., and Kenneth E. Breeding, all of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 2, 1989, Ser. No. 360,806

Int. Cl.[5] C08G 63/02

U.S. Cl. 528—272 20 Claims

1. A non-beat shrunk polyester melt blown web composition, comprising:

at least one polyester having an I.V. of about 0.4 to about 1.0 and comprising repeat units from

(a) at least one dibasic acid selected from terephthalic acid, isophthalic acid, aliphatic dicarboxylic acids having 3 to 20 carbon atoms, and cycloaliphatic dicarboxylic acids having 8 to 10 carbon atoms,

(b) at least one glycol selected from aliphatic glycols having 2 to 10 carbon atoms and cycloaliphatic glycols having 6 to 10 carbon atoms, and

(c) wherein said web composition shrinks no more than 10% in both its longitudinal and cross dimensions upon exposure to a temperature up to its melting temperature.

5,010,166

PROCESS AND APPARATUS FOR PRODUCING POLYOL POLYMERS AND POLYOL POLYMERS SO PRODUCED

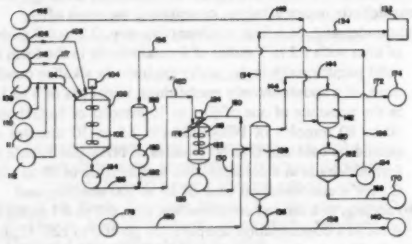
Kevin M. Scholsky, Citrus Heights, Calif.; Lisa M. Larsen, Little Lake, Mich., and Rodger C. Kruse, Racine, Wis., assignors to S. C. Johnson & Son, Inc., Racine, Wis.

Continuation-in-part of Ser. No. 356,647, May 19, 1989, Pat. No. 4,933,430, which is a continuation of Ser. No. 22,297, Mar. 5, 1987, abandoned. This application Feb. 16, 1990, Ser. No. 481,132

The portion of the term of this patent subsequent to Jun. 12, 2007, has been disclaimed.

Int. Cl.[5] C08G *69/14, 63/08, 67/02*

U.S. Cl. 528—323 17 Claims



1. A continuous polymerization process to produce a graft polymer having at least one main chain and a plurality of side chains attached thereto, the continuous polymerization process comprising the steps of:

combining in a reaction zone an (1) addition-polymerizable monomer that is also a free-radical initiator together with an (2) ethylenically-unsaturated monomer having a nucleophilic or an electrophilic moiety at a reaction temperature that is effective for initiating addition copolymerization of the addition-polymerizable monomer with the ethylenically-unsaturated monomer, wherein propagation by the addition-copolymerization reaction forms the main chain of the graft polymer;

while also combining in the reaction zone a polymerizable, carbonyl carbon-containing ringed molecule at a superatmospheric pressure effective, at the elevated temperature, to cause the ring portion of the ringed molecule to open in the vicinity of the carbonyl carbon thereof in response to the presence of the nucleophilic or the electrophilic moiety of the ethylenically-unsaturated monomer, for initiating ionic-copolymerization of the polymerizable ringed molecule with the nucleophilic-containing or electrophilic-containing moiety of the ethylenically-unsaturated monomer, wherein propagation by the ionic-copolymerization reaction forms the side chains of the graft polymer; and

terminating both of the addition-copolymerization and the ionic-copolymerization reactions when the thus-produced graft polymer attains a predetermined number-average and/or weight-average molecule weight, the polymerization process being characterized in that each of the main-chain and side-chain propagations occurs substantially simultaneously, relative to the other, and wherein the polymerization process is further characterized in that the ionic-copolymerization reaction occurs expressly excluding utilization of a catalyst for the carbonyl carbon-containing ringed molecule.

5,010,167

POLY(AMIDE-AND IMIDE-CO-ANHYDRIDE) FOR BIOLOGICAL APPLICATION

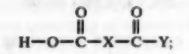
Eyal Ron, Lexington; Andrea Staubli, Belmont, and Robert S. Langer, Newton, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

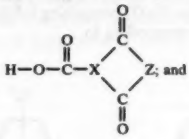
Filed Mar. 31, 1989, Ser. No. 331,432

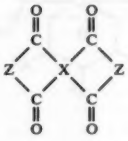
Int. Cl.[5] C08G *69/10*

U.S. Cl. 528—328 4 Claims

1. A biocompatible, biodegradable polymer produced from monomers selected from the group consisting of







wherein X is an aliphatic or aromatic group of C_1–C_{20}; Y is a C-terminus peptide or proline, and Z is a C-terminus peptide or amino acid, and having a weight average molecular weight of greater than 10,000.

5,010,168

ARAMID POLYMER FROM AROMATIC DICARBOXYLIC ACID MIXTURE AND AROMATIC DIAMINE MIXTURE

Doetze J. Sikkema, An Ellecom, Netherlands, assignor to Akzo nv, Arnhem, Netherlands

Division of Ser. No. 245,231, Sep. 16, 1988, Pat. No. 4,908,264. This application Dec. 8, 1989, Ser. No. 447,735

Claims priority, application Netherlands, Sep. 17, 1987, 8702221

Int. Cl.[5] C08G *69/32*

U.S. Cl. 528—338 15 Claims

1. A copolyamide, which expressed as the mole fraction of the total of amide bonds, comprises: (1) 0.22–0.28 units derived from terephatalic acid; (2) 0.22–0.28 units derived from paraphenylene diamine; (3) 0.22–0.28 units derived from isophthalic acid; and (4) 0.22–0.28 units derived from a 3,3'- or a 4,4'-diamine of diphenyl methane, diphenylpropane-2,2, diphenyl cyclohexane-1,1, diphenyl ether, diphenyl sulfide, diphenyl sulphone, or benzophenone.

5,010,169

POLYARYLENE SULPHIDE CONTAINING PHOSPHINE GROUPS

Burkhard Köhler, and Rolf-Volker Meyer, both of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Fed. Rep. of Germany

Division of Ser. No. 336,716, Apr. 12, 1989, abandoned. This application Nov. 13, 1989, Ser. No. 436,127

Claims priority, application Fed. Rep. of Germany, Apr. 29, 1988, 3814533

Int. Cl.[5] C08G *75/16*

U.S. Cl. 528—388 4 Claims

1. Linear or branched phosphorous containing polyarylene

sulphide prepared by the reaction of 0.1 to 10 mol-% of monomers corresponding to the following formula

(I)

wherein

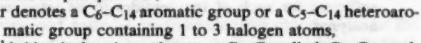
P denotes phosphorous,

Ar denotes a C_6–C_{14} aromatic group or a C_5–C_{14} heteroaromatic group containing 1 to 3 halogen atoms,

R^1 is identical to Ar or denotes a C_1–C_{22}-alkyl, C_6–C_{15}-aralkyl or C_6–C_{14} - aryl group,

R^2 is identical to Ar or R^1,

from 90 to 99.9 mol-% of monomers corresponding to the formula II



(II)

wherein

Ph represents a para- or metaphenylene group or a 4,4'-diphenylene group and

Hal represents halogen and the sum of all the halogen atoms is at least 2,

and 1 to 2 equivalents of an alkali metal sulfide.

5,010,170

POLYMERIZATION OF CARBON MONOXIDE/OLEFIN WITH AT LEAST ONE TETRA ARYL DIPHOSPHINE LIGAND

Gerrit G. Rosenbrand, Amsterdam, Netherlands, and Pui K. Wong, Katy, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Oct. 20, 1989, Ser. No. 424,650

Claims priority, application Netherlands, Oct. 24, 1988, 8802611

Int. Cl.[5] C08G 67/02

U.S. Cl. 528—392 12 Claims

1. In the process of producing a linear alternating polymer of carbon monoxide and at least one ethylenically unsaturated hydrocarbon by contacting the carbon monoxide and unsaturated hydrocarbon under polymerization conditions in the presence of a catalyst composition formed from a palladium compound, the anion of a non-hydrohalogenic acid having a pKa below about 4 and at least one tetraaryl diphosphine ligand, the improvement wherein the ligand comprises a mixture of tetraaryl disphosphines wherein one diphosphine contains an ortho alkoxy substituent on each aryl group and one diphosphine is free of ortho alkoxy substituents on aryl groups.

5,010,171

CARBON MONOXIDE/OLEFIN POLYMERIZATION WITH CATALYST COMPRISING P. BIDENTATE LIGAND HAVING NON-HYDROCARBYL SUBSTITUENT

Johannes A. M. van Broekhoven, and Wiebren A. Miedema, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Sep. 15, 1989, Ser. No. 408,012

Claims priority, application Netherlands, Sep. 22, 1988, 8802347

Int. Cl.[5] C08G 67/02

U.S. Cl. 528—392 10 Claims

1. In the process of producing linear alternating polymer by polymerizing carbon monoxide and at least one ethylenically unsaturated hydrocarbon in a series of polymerizations over time, each of the polymerizations being conducted under polymerization conditions in the presence of an alkanol reaction diluent and a catalyst composition, the improvement of employing in each polymerization a portion of a catalyst composition solution prepared by adding a bidentate ligand of phosphorus containing a non-hydrocarbyl substituent on at least one carbon atom and a palladium alkanoate to an aprotic, polar solvent and subsequently adding a halogenated aliphatic monocarboxylic acid having a pKa below 2, and recovering linear alternating polymer of carbon monoxide and at least one ethylenically unsaturated hydrocarbon of relatively uniform molecular weight from the series of polymerizations.

5,010,172

POLYMERIZATION OF CARBON MONOXIDE/OLEFIN WITH TERTIARY MONOPHOSPHINE OR SECONDARY MONOPHOSPHINE OXIDE

Petrus W. N. M. Van Leeuwen, and Cornelis F. Roobeek, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Dec. 28, 1989, Ser. No. 458,251

Claims priority, application Netherlands, Jun. 20, 1989, 8900139

Int. Cl.[5] C08G 67/02

U.S. Cl. 528—392 16 Claims

1. A process for the production of linear alternating polymer of carbon monoxide and at least one ethylenically unsaturated hydrocarbon by contacting the carbon monoxide and ethylenically unsaturated hydrocarbon under polymerization conditions in the liquid phase in the presence a catalytic quantity of a catalyst composition formed from (a) a palladium salt of an acid having a pKa less than 2; (b) a bidentate ligand of phosphorus, and (c) a tertiary monophosphine or secondary monophosphine oxide provided in a quantity of from about 0.25 mol to about 2 mol per mol of palladium salt.

5,010,173

FREE RADICAL STABILIZED ALKOXYLATES

Anthony J. O'Lenick, Jr., Lilburn, Ga.; John C. Miller, Hawthorn Woods, Ill., and J. Michael Clumpner, Delavan, Wis., assignors to LCE Partnership, Lake Geneva, Wis.

Continuation-in-part of Ser. No. 418,630, Oct. 10, 1918. This application Jun. 4, 1990, Ser. No. 532,856

Int. Cl.[5] C08G 65/10; C08L 71/02

U.S. Cl. 528—408 18 Claims

1. A polyoxyalkylene composition which is prepared by the reaction of;

(a) a dihydroxy compound, selected from ethylene glycol, propylene glycol, diethylene oxide, and dipropylene glycol said dihydroxy compound containing an effective inhibitory amount of a stable free radical compound; and

(b) an alkylene oxide selected from ethylene oxide, propylene oxide, butylene oxide, and mixtures thereof.

5,010,174

NOVEL CALCITONIN DERIVATIVE AND SALT THEREOF

Sachio Hirose, Tokyo; Motomu Hane, and Masanobu Inagawa, both of Ibaraki, all of Japan, assignors to Mitsubishi Petrochemical Co., Ltd., Tokyo, Japan

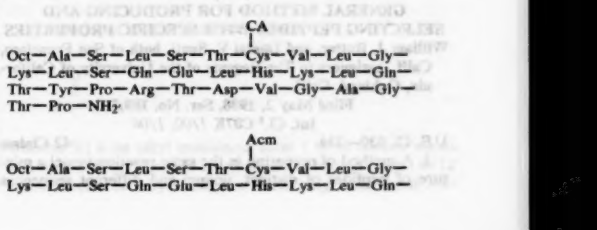
Continuation-in-part of Ser. No. 215,280, Jul. 5, 1988, abandoned. This application May 17, 1989, Ser. No. 353,336

Claims priority, application Japan, Jul. 8, 1987, 62-168583; Feb. 17, 1988, 63-32888; Nov. 24, 1988, 63-294761

Int. Cl.[5] C07K 7/36

U.S. Cl. 530—307 5 Claims

1. A calcitonin derivative or a pharmaceutically acceptable salt thereof selected from the group consisting:



-continued

Thr—Tyr—Pro—Arg—Thr—Asp—Val—Gly—Ala—Gly—
Thr—Pro—NH_2,

Acm
|
Oct—Ser—Asn—Leu—Ser—Thr—Cys—Val—Leu—Gly—
Lys—Leu—Ser—Gln—Glu—Leu—His—Lys—Leu—Gln—
Thr—Tyr—Pro—Arg—Thr—Asp—Val—Gly—Ala—Gly—
Thr—Pro—NH_2,

CA
|
Oct—Ala—Thr—Leu—Ser—Thr—Cys—Val—Leu—Gly—
Lys—Leu—Ser—Gln—Glu—Leu—His—Lys—Leu—Gln—
Thr—Tyr—Pro—Arg—Thr—Asp—Val—Gly—Ala—Gly—
Thr—Pro—NH_2,

CA
|
Oct—Ala—Ala—Leu—Ser—Thr—Cys—Val—Leu—Gly—
Lys—Leu—Ser—Gln—Glu—Leu—His—Lys—Leu—Gln—
Thr—Tyr—Pro—Arg—Thr—Asp—Val—Gly—Ala—Gly—
Thr—Pro—NH_2,

CA
|
pGlu—Ala—Ser—Leu—Ser—Thr—Cys—Val—Leu—Gly—
Lys—Leu—Ser—Gln—Glu—Leu—His—Lys—Leu—Gln—
Thr—Tyr—Pro—Arg—Thr—Asp—Val—Gly—Ala—Gly—
Thr—Pro—NH_2,

Acm
|
Oct—Ala—Thr—Leu—Ser—Thr—Cys—Val—Leu—Gly—
Lys—Leu—Ser—Gln—Glu—Leu—His—Lys—Leu—Gln—
Thr—Tyr—Pro—Arg—Thr—Asp—Val—Gly—Ala—Gly—
Thr—Pro—NH_2,

Acm
|
pGlu—Ala—Thr—Leu—Ser—Thr—Cys—Val—Leu—Gly—
Lys—Leu—Ser—Gln—Glu—Leu—His—Lys—Leu—Gln—
Thr—Tyr—Pro—Arg—Thr—Asp—Val—Gly—Ala—Gly—
Thr—Pro—NH_2,

CA
|
Kcp—Ala—Ser—Leu—Ser—Thr—Cys—Val—Leu—Gly—
Lys—Leu—Ser—Gln—Glu—Leu—His—Lys—Leu—Gln—
Thr—Tyr—Pro—Arg—Thr—Asp—Val—Gly—Ala—Gly—
Thr—Pro—NH_2, and

Oct—Ala—Ser—Leu—Ser—Thr—Cys—Val—Leu—Gly—
Lys—Leu—Ser—Gln—Glu—Leu—His—Lys—Leu—Gln—
Thr—Tyr—Pro—Arg—Thr—Asp—Val—Gly—Ala—Gly—
Thr—Pro—NH_2,

Kcp-Ala-Ser-Leu-Ser-Thr

wherein Ala represents alanine, Arg: arginine, Asn: asparagine, Asp: aspartic acid, Cys: cysteine, Gln: glutamine, Glu: glutamic acid, Gly: glycine, His: histidine, Ile: isoleucine, Leu: leucine, Lys: lysine, Met: methionine, Phe: phenylalanine, Pro: proline, Ser: serine, Thr: threonine, Trp: tryptophan, Try: tyrosine, Val: valine, Cys: cystine, Oct: 3-oxo-5-carboxyperhydro-1,4-thiazine, CA: carbamoylmethyl, Acm: acetamidomethyl, pGlu: pyroglutamic acid and Kpc: 2-keto-piperidine-6-carboxylic acid.

5,010,175

GENERAL METHOD FOR PRODUCING AND SELECTING PEPTIDES WITH SPECIFIC PROPERTIES

William J. Rutter, and Daniel V. Santi, both of San Francisco, Calif., assignors to The Regents of the University of California, Oakland, Calif.

Filed May 2, 1988, Ser. No. 189,318
Int. Cl.[5] C07K *1/00, 1/04*
U.S. Cl. 530—334 **42 Claims**

1. A method of preparing in the same reaction vessel a mixture of peptides of distinct, unique and different sequences which mixture contains each peptide in retrievable and analyzable amounts and in substantially equal molar amounts, comprising:

combining and reacting activated amino acids with an acceptor amino acid or peptide wherein said activated amino acids are provided in concentrations relative to each other based on the relative coupling constants so that the mixture of the peptides resulting from the reaction contains each of the peptides in predictable and defined amounts sufficient for each of the peptides to be retrieved and analyzed.

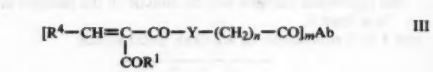
5,010,176

ANTIBODY-DRUG CONJUGATES

Russell L. Barton, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Nov. 10, 1988, Ser. No. 269,815
Int. Cl.[5] C07K *15/28, 17/06*
U.S. Cl. 530—388 **20 Claims**

1. A modified antibody or antibody fragment of the formula



III

wherein

R^1 is a carboxylic acid protecting group;

R^4 is C_1–C_4 alkoxy;

Y is —O—, —NH—, $—NCH_3—$ or $—NC_2H_5—$;

n is an integer from 1 to about 8;

m is an integer from 1 to about 10; and

Ab is an antibody or antigen-recognizing fragment thereof, which recognizes an antigen associated with a cell to which delivery of the drug is desirable.

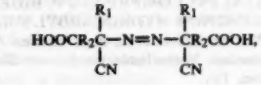
5,010,177

PROCESS FOR THE PREPARATION OF AN AZONITRILE DICARBOXYLIC ACID INITIATOR IN ACETONE HAVING A LOW SALT AND LOW WATER CONTENT

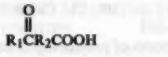
John T. Lai, Broadview Heights, and Deborah S. Filla, Northfield, both of Ohio, assignors to The BFGoodrich Company, Akron, Ohio

Filed Dec. 26, 1989, Ser. No. 457,057
Int. Cl.[5] C07C *245/04;* C08F *4/04*
U.S. Cl. 534—586 **26 Claims**

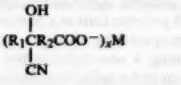
1. A process for the preparation of an azonitrile initiator in acetone having a low salt, low water content, comprising; forming



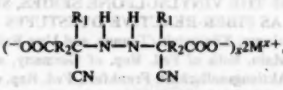
by reacting a keto acid of the formula



with $M(CN)_x$ to form a cyanohydrin metal carboxylate of the formula



and reacting the metal carboxylate with a hydrazine source and hydrochloric acid to obtain a hydrazo intermediate of the formula



reacting said hydrazo intermediate with chlorine gas in the presence of acetone to oxidize the hydrazo intermediate to form the azonitrile initiator in a liquid medium, forming at least two liquid layers, discarding the bottom aqueous layer and adding solid calcium chloride or an aqueous saturated solution of calcium chloride to the upper layer to further remove additional water and $M(Cl)_x$ from the acetone layer containing the azonitrile initiator, wherein R_1 is an alkyl containing from about 1 to about 12 carbon atoms, R_2 is a direct bond or an alkylene containing from 1 to about 12 carbon atoms, or a cycloalkylene or alkyl cycloalkylene containing from about 3 to about 12 carbon atoms, and M is a metal selected from the class consisting of lithium, sodium, potassium, magnesium, or calcium.

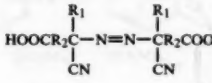
5,010,178

PROCESS FOR THE PREPARATION OF MIXED AZONITRILE CARBOXYLIC ACID INITIATORS

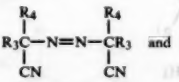
John T. Lai, Broadview Heights, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Dec. 26, 1989, Ser. No. 456,886
Int. Cl.[5] C07C 245/04; C08F 4/04
U.S. Cl. 534—586 **23 Claims**

1. A process for the preparation of mixed azonitrile initiators, comprising; forming

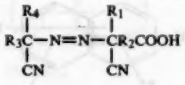


I



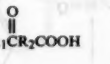
II

and

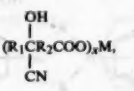


III

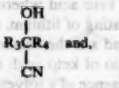
by reacting a keto acid of the formula



with $M(CN)_x$ and a catalytic amount of hydrochloric acid to form a cyanohydrin metal carboxylate of the formula

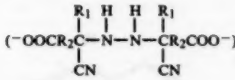


adding to the cyanohydrin metal carboxylate a cyanohydrin of the formula

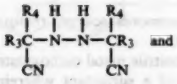


and,

reacting the mixture with a hydrazine source to obtain a mixture of hydrazo intermediates of the formulae

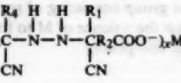


IV



V

and



VI

and reacting said mixture of hydrazo intermediates with chlorine gas in the presence of acetone solvent to oxidize the mixture of hydrazo intermediates and form the mixed azonitrile initiators wherein R_1 is an alkyl containing from about 1 to about 12 carbon atoms, R_2 is a direct bond or an alkylene containing from 1 to about 12 carbon atoms, or a cycloalkylene or alkyl cycloalkylene containing from about 3 to about 12 carbon atoms, R_3 and R_4, independently, are alkyls containing from 1 to about 12 carbon atoms, or one of R_3 and R_4 is an alkoxy containing from 1 to about 4 carbon atoms, and M is a metal selected from the class consisting of lithium, sodium, potassium, magnesium, or calcium.

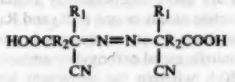
5,010,179

PROCESS FOR THE PREPARATION OF MIXED, SYMMETRICAL AZONITRILE DICARBOXYLIC DICYANO ACIDS AND INITIATORS

John T. Lai, Broadview Heights, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

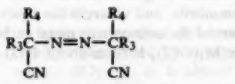
Filed Dec. 26, 1989, Ser. No. 457,058
Int. Cl.[5] C07C 245/04; C08F 4/04
U.S. Cl. 534—586 **23 Claims**

1. A process for the preparation of mixed, symmetrical azonitrile initiators, comprising;
forming



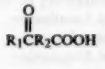
I

and



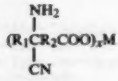
II

by reacting a keto acid of the formula



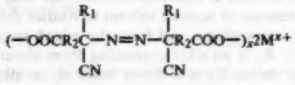
wherein R_1 is an alkyl containing from 1 to 12 carbon atoms and R_2 is a direct bond, or an alkylene containing from 1 to 12 carbon atoms or a cycloalkylene containing from about 3 to

about 12 carbon atoms, with from 1 to 2 equivalents of $M(CN)_x$ per mole of keto acid wherein M is a metal selected from the group consisting of lithium, sodium, potassium, magnesium, or calcium and x is the valence of M and an ammonia source in a molar ratio of keto acid: ammonia source of from about 1:1–4 in the presence of a solvent to form an aminonitrile metal carboxylate of the formula



removing excess ammonia source, removing methanol if used as a solvent,

reacting said aminonitrile metal carboxylate with $M_1(OCl)_x$ in the presence of a surfactant wherein M_1 is a metal selected from the group consisting of sodium, potassium, or calcium and x is the valence of M to form an azonitrile metal carboxylate comprising

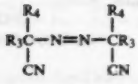


III

and also

reacting an aminonitrile of the formula

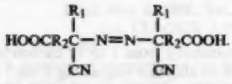
in the presence of a surfactant and $M_1(OCl)_x$ to form a symmetrical azonitrile initiator



II

wherein R_3 and R_4 are alkyl independently containing from 1 to about 12 carbon atoms or one of R_3 and R_4 is an alkoxy of from 1 to about 4 carbon atoms wherein the molar ratio of aminonitrile metal carboxylate:aminonitrile is from about 0.5–10:1, wherein the surfactant is from about 0.05 percent active to about 0.20 percent active by weight based on the total weight of aminonitrile metal carboxylate and aminonitrile, and wherein the equivalent weight ratio of the sum of the aminonitrile metal carboxylate and aminonitrile: $M_1(OCl)_x$ is from about 1:1.0–2.75, and

reducing excess $M_1(OCl)_x$ with a reducing agent and further neutralizing the metal azonitrile carboxylate to form



I

5,010,180

WATER-SOLUBLE AZO COMPOUNDS HAVING A N-(PHENETHYL)-AMIDO-CARBONYL-METHOXYPHENYL RADICAL, SUBSTITUTED BY A FIBER-REACTIVE GROUP OF THE VINYLSULFONE SERIES, SUITABLE AS FIBER-REACTIVE DYESTUFFS

Hartmut Springer, Königstein/Taunus, and Uwe Reiher, Frankfurt am Main, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

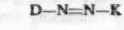
Filed Feb. 1, 1990, Ser. No. 473,620

Claims priority, application Fed. Rep. of Germany, Feb. 3, 1989, 3903224

Int. Cl.[5] **C09B** *62/085, 62/51, 62/513;* **D06P** *1/384*

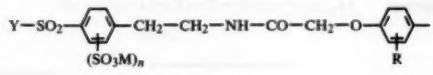
U.S. Cl. 534—638 **12 Claims**

1. A water-soluble azo compound corresponding to the formula



in which:

D is a group of the formula



in which:

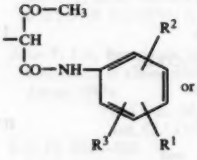
Y is vinyl or a group of the formula $—CH_2—CH_2—X$ in which X is a substituent which is eliminated by an alkali while forming the vinyl,

R is hydrogen, nitro, alkyl of 1 to 4 carbons, alkoxy of 1 to 4 carbons, carboxy, hydroxy or halogen,

n is zero or 1, and

M is hydrogen or an alkali-metal, and

K is a group of the formula



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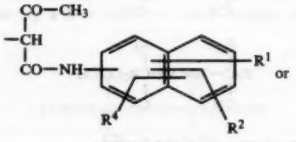

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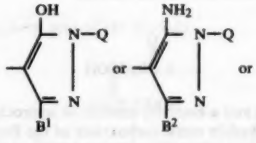

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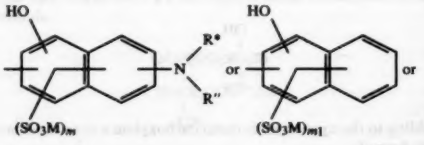

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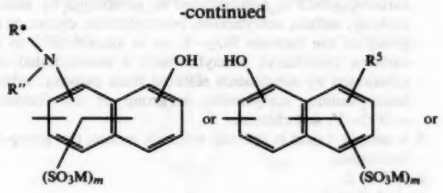

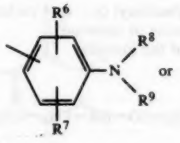

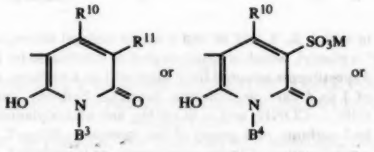

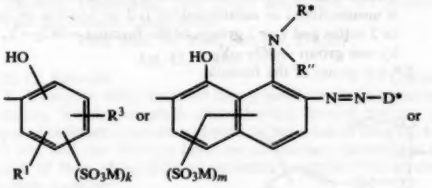

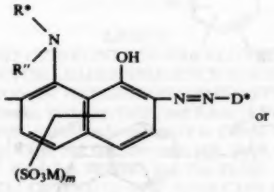

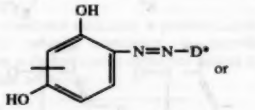

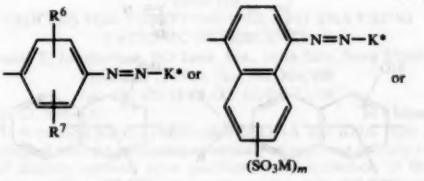

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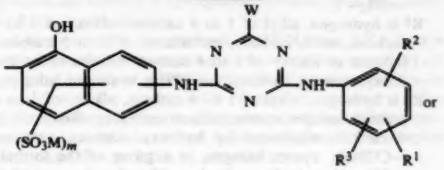
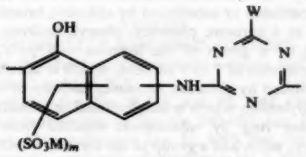
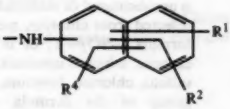






in which

R^1 is hydrogen, carboxy, sulfo, or a group of the formula $-SO_2-Y$;

R^2 is hydrogen, alkyl of 1 to 4 carbons, alkoxy of 1 to 4 carbons, chlorine, bromine, carboxy, sulfo, or nitro;

R^3 is hydrogen, alkyl of 1 to 4 carbons, alkoxy of 1 to 4 carbons, chlorine, or bromine;

R^4 is hydrogen, sulfo, or carboxy;

B^1 is alkyl of 1 to 4 carbons, carboxy, carbalkoxy of 2 to 5 carbons, $-CONH_2$, or phenyl, which is unsubstituted or substituted by substituents selected from sulfo, carboxy, methyl, ethyl, methoxy, ethoxy, and chlorine;

B^2 is alkyl of 1 to 4 carbons, carboxy, carbalkoxy of 2 to 5 carbons, $-CONH_2$, or phenyl, which is unsubstituted or substituted by 1 or 2 substituents selected from alkyl of 1 to 4 carbons, alkoxy of 1 to 4 carbons, chlorine, bromine, or sulfo;

Q is phenyl, which is unsubstituted or substituted by one, two, or three substituents selected from chlorine, bromine, methyl, ethyl, methoxy, ethoxy, carboxy, sulfo, acetylamino, and a group of the formula $-SO_2-Y$, or is a naphthyl, which is unsubstituted or substituted by one, two, or three sulfos, or by an alkyl of 1 to 4 carbons, an alkoxy of 1 to 4 carbons, a chlorine, or an alkanoylamino of 2 to 5 carbons, or by a group of the formula $-SO_2-Y$, or is naphthyl substituted by one, two or three sulfos and by a group selected from alkyl of 1 to 4 carbons, alkoxy of 1 to 4 carbons, chlorine, alkanoylamino of 2 to 5 carbons and a group of the formula $-SO_2-Y$;

R^* is hydrogen, or alkyl or 1 to 4 carbons, which is unsubstituted or substituted by a phenyl which is further unsubstituted or substituted by sulfo, or by $-SO_2-Y$, or by sulfo and $-SO_2-Y$

R'' is hydrogen, or alkyl or 1 to 4 carbons which is unsubstituted or substituted by phenyl, or by a group of the formula $-SO_2-Y$, or is phenyl which is unsubstituted or substituted by one or two substituents selected from alkyl of 1 to 4 carbons, alkoxy of 1 to 4 carbons, chlorine, bromine, sulfo, and $-SO_2-Y$;

R^5 is phenylureido wherein the phenyl is unsubstituted or substituted by a group of the formula $-SO_2-Y$, or is alkanoylamino of 2 to 5 carbons which is unsubstituted or substituted in the alkyl moiety by a group of the formula $-SO_2-Y$, or is alkenoylamino of 3 to 5 carbons or is benzoylamino which is unsubstituted or substituted by substituents selected from chlorine, methyl, methoxy,

nitro, sulfo, carboxy, and a group of the formula $-SO_2-Y$;

R^6 is hydrogen, alkyl of 1 to 4 carbons, alkoxy of 1 to 4 carbons, sulfo, carboxy, carbalkoxy of 2 to 5 carbons, halogen or alkoxy of 1 to 4 carbons substituted by hydroxy, acetoxy, carboxy, $-CONH_2$, cyano, or halogen;

R^7 is hydrogen, alkyl of 1 to 4 carbons, alkoxy of 1 to 4 carbons, halogen, cyano, trifluoromethyl or alkoxy of 1 to 4 carbons substituted by hydroxy, acetoxy, carboxy, $-CONH_2$, cyano, halogen, or a group of the formula $-SO_2-Y$, or is alkanoylamino of 2 to 5 carbons which is unsubstituted or substituted by chlorine, bromine, alkoxy of 1 to 4 carbons, phenoxy, phenyl, hydroxy, carboxy, sulfo, or a group of the formula $-SO_2-Y$, or is alkenoylamino of 3 to 5 carbons, which is unsubstituted or substituted by chlorine, bromine, carboxy or sulfo, or is benzoylamino which is unsubstituted or substituted in the benzene ring by substituents selected from chlorine, methyl, sulfo, and a group of the formula $-SO_2-Y$, or is alkylsulfonyl of 1 to 4 carbons or is phenylsulfonyl which is unsubstituted or substituted in the phenyl by substituents selected from chlorine, methyl, sulfo, and a group of the formula $-SO_2-Y$, or is alkylsulfonylamino of 1 to 4 carbons, which is unsubstituted or substituted by hydroxy, sulfato, chlorine, bromine, alkoxy of 1 to 4 carbons or a group of the formula $-SO_2-Y$, or is phenylsulfonylamino, which is unsubstituted or substituted in the phenyl by substituents selected from chlorine, methyl, sulfo, and a group of the formula $-SO_2-Y$, or is $-CONH_2$, which is unsubstituted or mono- or disubstituted on the nitrogen by one or two substituents selected from the group: alkyl of 1 to 4 carbons; alkyl of 1 to 4 carbons substituted by hydroxy, sulfo, carboxy, sulfato, phenyl, or a group of the formula $-SO_2-Y$; cycloalkyl of 5 to 8 carbons, phenyl, which is unsubstituted or substituted by substituents selected from chlorine, sulfo, methyl, methoxy, carboxy, and a group of the formula $-SO_2-Y$; or is sulfamoyl, which is unsubstituted or mono- or disubstituted on the nitrogen by one or two substituents selected from the group consisting of: alkyl of 1 to 4 carbons; alkyl of 1 to 4 carbons substituted by hydroxy, sulfo, carboxy, sulfato, phenyl, or a group of the formula $-SO_2-Y$, cycloalkyl of 5 to 8 carbons; phenyl, which is unsubstituted or substituted by substituents selected from chlorine, sulfo, methyl, methoxy, carboxy, and a group of the formula $-SO_2-Y$; or is ureido, which is unsubstituted or mono- or disubstituted on the terminal nitrogen by one or two substituents from the group consisting of: alkyl or 1 to 4 carbons, alkyl of 1 to 4 carbons substituted by substituents selected from hydroxy, sulfo, carboxy, sulfato, phenyl, or a group of the formula $-SO_2-Y$; cycloalkyl of 5 to 8 carbons; phenyl, which is unsubstituted or substituted by substituents selected from the group consisting of chlorine, sulfo, methyl, methoxy, carboxy, and a group of the formula $-SO_2-Y$;

R^8 is hydrogen, alkyl of 1 to 4 carbons, or alkyl or 1 to 4 carbons substituted by hydroxy, sulfo, carboxy, sulfato, a group of the formula $-SO_2-Y$, or by phenyl, or is alkenyl of 2 to 4 carbons which is unsubstituted or substituted by carboxy, sulfo, chlorine or bromine, or is cycloalkyl or 5 to 8 carbons;

R^9 is hydrogen, or alkyl of 1 to 4 carbons or alkyl or 1 to 4 carbons which is unsubstituted or substituted by hydroxy, sulfo, carboxy, sulfato, phenyl, or a group of the formula $-SO_2-Y$, or is alkenyl of 2 to 5 carbons which is unsubstituted or substituted by carboxy, sulfo, a group of the formula $-SO_2-Y$, chlorine, or bromine, or is cycloalkyl of 5 to 8 carbons or phenyl, which is unsubstituted or substituted by substituents selected from chlorine, sulfo, methyl, methoxy, carboxy, and a group of the formula $-SO_2-Y$, or

R^8 and R^9 represent together with the nitrogen piperidino, morpholino or piperazino;

R^{10} is hydrogen, or alkyl of 1 to 4 carbons which is unsubstituted or substituted by alkoxy of 1 to 4 carbons or by cyano;

R^{11} is hydrogen, sulfo, sulfoalkyl with an alkyl moiety or 2 to 5 carbons, cyano, or $-CONH_2$;

B^3 is hydrogen, or alkyl or 1 to 6 carbons which is unsubstituted or substituted by phenyl, sulfo, sulfophenyl, or a group of the formula $-SO_2-Y$;

B^4 is hydrogen, alkoxy of 1 to 4 carbons, alkyl or 1 to 4 carbons, which is unsubstituted or substituted by sulfo, carboxy, sulfato, acetylamino, benzoylamino, cyano, or a group of the formula SO_2-Y, or is alkenyl of 2 to 4 carbons, cyclohexyl, phenyl, which is unsubstituted or substituted by substituents selected from carboxy, sulfo, benzoylamino, acetylamino, a group of the formula —SO2—Y, and chlorine;

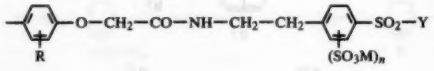
K is zero or 1 (and in the case where K is zero, this group is hydrogen);

m is 1 or 2;

m_1 is 1, 2 or 3;

W is sulfo, alkylsulfonyl or 1 to 4 carbons, phenylsulfonyl, bromine, fluorine or chlorine;

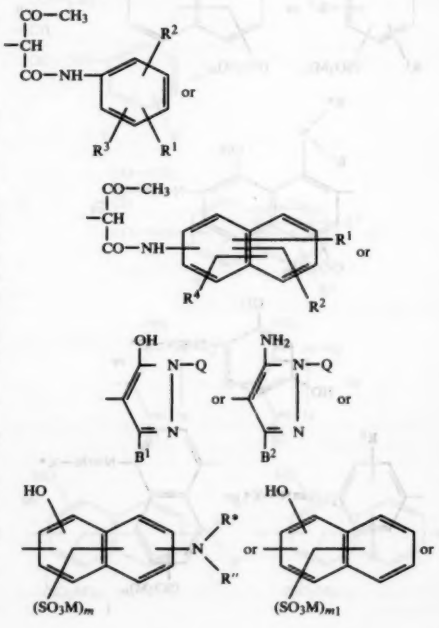
D^* is a group of the formula



in which R, Y and M and n are as defined above, or

D^* is phenyl, which is unsubstituted or substituted by 1, 2, or 3 substituents selected from alkyl of 1 to 4 carbons, alkoxy of 1 to 4 carbons, chlorine, bromine, hydroxy, carboxy, sulfo, $-CONH_2$ and $-SO_2NH_2$, and alkanoylamino of 2 to 5 carbons, or a group of the formula $-SO_2-Y$, or by a combination of those substituents, or is naphthyl, which is unsubstituted or substituted by 1, 2 or 3 sulfos, or by 1 or 2 sulfos and 1 or 2 groups of the formula $-SO_2-Y$, or by one group $-SO_2-Y$;

K^* is a group of the formula



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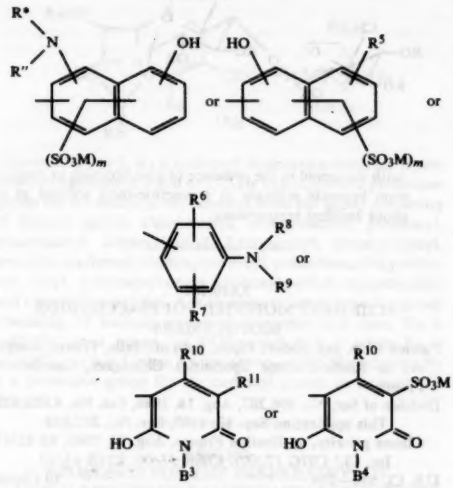


5,010,181

PARTIALLY TREATED SHELLFISH WASTE FOR REMOVAL OF HEAVY METALS FROM AQUEOUS SOLUTION

Robert W. Coughlin, The University of Connecticut, Dept. of Chemical Engineering, Box U-139, Room 204, 191 Auditorium Rd., Storrs, Conn. 06268

Filed Mar. 28, 1988, Ser. No. 174,357
Int. Cl.[5] C08B *37/08*
U.S. Cl. 536—20 12 Claims

1. A particle which removes heavy metal ions from aqueous solution, which comprises chitin having formed thereon a layer of chitosan, wherein said particle has a size of from 0.2 to 1.5 cm, and the chitosan layer on the surface thereof has a depth of from about 0.01 micrometers to about 10% of the particle diameter.

5,010,182

DNA CONSTRUCTS CONTAINING A KLUYVEROMYCES ALPHA FACTOR LEADER SEQUENCE FOR DIRECTING SECRETION OF HETEROLOGOUS POLYPEPTIDES

Anthony J. Brake, Berkeley, Calif., and Johan A. Van Den Berg, Ad Reeuwijk, Netherlands, assignors to Chiron Corporation, Emeryville, Calif. and Gist-Brocades NV, Delft, Netherlands

Filed Jul. 28, 1987, Ser. No. 78,551
Int. Cl.[5] C07H *15/12*; C12P *21/00*; C12N *15/00*
U.S. Cl. 536—27 7 Claims

1. A DNA construct encoding a protein having an amino acid sequence which comprises a secretion-directing Kluyveromyces α-factor leader sequence linked to a heterologous polypeptide sequence.

5,010,183

PROCESS FOR PURIFYING DNA AND RNA USING CATIONIC DETERGENTS

Donald E. Macfarlane, 943 Iowa Ave., Iowa City, Iowa 52240

Filed Jul. 7, 1989, Ser. No. 376,709
Int. Cl.[5] C07H *21/00, 21/02, 21/04*
U.S. Cl. 536—27 24 Claims

1. A process for the purification of DNA and RNA from a biological mixture consisting essentially of applying directly to said mixture without prior purification or extraction of the nucleic acids a selected quaternary amine cationic detergent capable of simultaneously solubilizing contaminants in said mixture and forming a hydrophobic complex with said DNA or RNA in said mixture.

3. A process for the purification of DNA and RNA from a biological mixture containing virus consisting essentially of applying directly to said mixture without prior purification or extraction of the nucleic acids of selected quaternary amine cationic detergent capable of simultaneously solubilizing contaminants in said mixture and forming a hydrophobic complex with said DNA or RNA in said mixture.

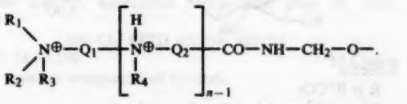
5,010,184

IONICALLY MODIFIED AGAROSE

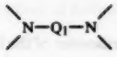
Jürg Merz, Biel-Benken, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 38,418, Apr. 10, 1987, abandoned, which is a continuation of Ser. No. 745,550, Jun. 17, 1985, abandoned. This application Jun. 21, 1989, Ser. No. 371,669
Claims priority, application Switzerland, Jul. 6, 1984, 3287/84
Int. Cl.[5] C07H *5/04*
U.S. Cl. 536—55.1 7 Claims

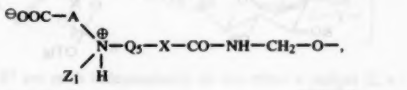
1. An uncrosslinked or crosslinked agarose which contains basic radicals of the formula



wherein n is 1 or 2, each of R_1, R_2, R_3 and R_4 independently is hydrogen, C_1–C_4alkyl which is unsubstituted or substituted by hydroxy, nitrile, halogen or C_1–C_4alkoxy, cyclopentyl or cyclohexyl or C_1–C_4alkyl-substituted cyclopentyl or cyclohexyl, benzyl or phenyl, each unsubstituted or substituted by nitro or halogen, or R_1 and R_2, together with the nitrogen atom to which they are attached form a 5- or 6-membered heterocyclic ring, or R_3 and R_3, together with the grouping

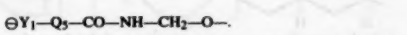


to which they are attached also form a 5- or 6-membered heterocyclic ring, and each of Q_1 and Q_2 independently is C_1–C_8alkylene, or zwitterionic radicals of the formula



wherein X is —O—, —S—,

or a direct bond, R_{11} is hydrogen or C_1–C_4alkyl, Q_5 is a C_1–C_8alkylene or phenylene radical, each of which is unsubstituted or substituted by C_1–C_4alkyl or phenyl, Z_1 is —B—$COO^{\ominus}$, C_1–C_4alkyl or hydrogen, and A and B are each independently of the other C_1–C_8alkylene which is unsubstituted or substituted by C_1–C_4alkyl, C_1–C_4alkoxy or phenyl, or acid radicals of the formula



wherein $Y_1\ominus$ is $—COO\ominus$, $—SO_3\ominus$ or $—P(OR_{11})O_2\ominus$, R_{11} is hydrogen and Q_5 is a C_1–C_8alkylene or phenylene radical, each of which is unsubstituted or substituted by C_1–C_4alkyl or phenyl, which radicals are attached to said agarose through the ether oxygen of the —CO—NH—CH_2—O— group of said radicals.

5,010,185

PROCESSES FOR TIGOGENIN BETA-CELLOBIOSIDE

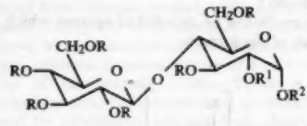
Frank J. Urban, Waterford, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Jun. 13, 1989, Ser. No. 365,588

Int. Cl.[5] **C07J** *53/00;* **C07H** *15/24, 1/00*

U.S. Cl. 536—6.1 **14 Claims**

1. A compound of the formula

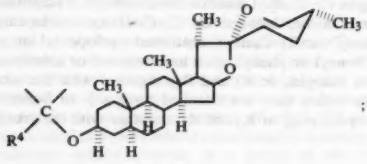


(I)

wherein

R is R^4CO;

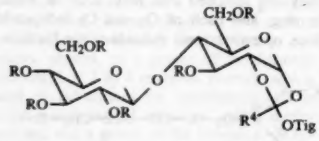
R^1 and R^2 are taken together and are



; and

R^4 is C_1–C_4)alkyl.

7. A process for the synthesis of an orthoester of the formula



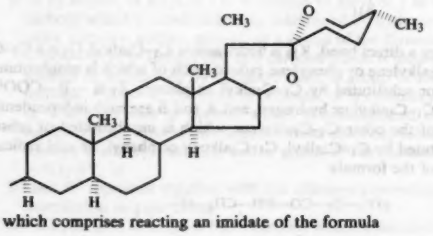
(IV)

wherein

R is R^4CO;

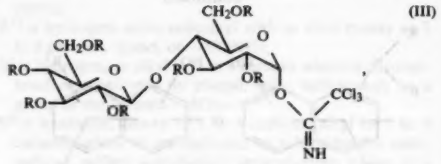
R^4 is (C_1–C_4)alkyl; and

Tig is



;

which comprises reacting an imidate of the formula



(III)

with tigogenin in the presence of zinc bromide or magnesium bromide etherate in a reaction-inert solvent at or about ambient temperature.

5,010,186

ACID/HEAT MODIFIED POLYSACCHARIDE BIOPOLYMERS

Patrick Cros, and Robert Pipon, both of Melle, France, assignors to Rhone-Poulenc Specialties Chimiques, Courbevoie, France

Division of Ser. No. 896,282, Aug. 14, 1986, Pat. No. 4,873,323. This application Sep. 13, 1989, Ser. No. 372,819

Claims priority, application France, Aug. 14, 1985, 85 12382

Int. Cl.[5] **C07G** *17/001;* **C08B** *37/00;* **E21B** *43/22*

U.S. Cl. 536—114 **10 Claims**

1. The product of the process for the preparation of a modified polysaccharide biopolymer, comprising (i) acidifying an aqueous composition of a polysaccharide with nitric acid to a pH from about 2 to 0.1, (ii) heat-treating said acidified composition at a temperature of from about 50° C. to 100° C. for from about 5 to 60 minutes, and (iii) cooling said heat-treated composition and adjusting the pH thereof to a value of from about 5 to 7.

5,010,187

PRODUCTION OF POLYETHER POLYOLS WITH REDUCED UNSATURATION

Albert J. Heuvelsland, Heikant, Netherlands, assignor to Dow Chemical Company, Midland, Mich.

Filed Nov. 18, 1988, Ser. No. 273,375

Int. Cl.[5] **C07H** *1/00;* **C08B** *37/00*

U.S. Cl. 536—120 **10 Claims**

1. A process for preparing a polyester polyol having an equivalent weight of from about 200 to about 5000 by reacting a monoepoxy compound comprising propylene oxide with an initiator containing at least two active hydrogens in the presence of a catalyst, wherein said catalyst is a substance selected from the group consisting of barium, strontium and their oxide, hydroxides, hydrated hydroxides or monohydroxide salts, or mixtures thereof and characterized in that the resulting polyol has a total unsaturation level of less than 0.080 milliequivalents/gram polyol.

5,010,188

CEPHEM DERIVATIVES

Hiroshi Yamauchi; Isao Sugiyama; Isao Saito; Seiichiro Nomoto; Takashi Kamiya; Yoshimasa Machida, and Shigeto Negi, all of Ibaraki, Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

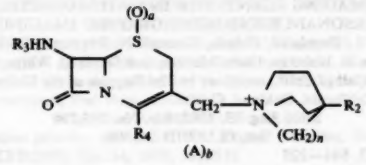
Division of Ser. No. 818,824, Jan. 14, 1986, Pat. No. 4,748,171. This application Mar. 16, 1988, Ser. No. 167,152

Claims priority, application Japan, Jan. 14, 1985, 60-3181; Apr. 11, 1985, 60-75333; Aug. 9, 1985, 60-174326

Int. Cl.[5] **C07D** *501/38;* **A61K** *31/545*

U.S. Cl. 540—222 **9 Claims**

1. A compound represented by the formula:



wherein n is 1 or 2, R_2 is hydroxyl, hydroxyl-substituted lower alkyl, or carbamoyl, a is 0 or 1, R_3 is hydrogen or a protective group for the amino group selected from the group consisting of formyl, acetyl, chloroacetyl, dichloroacetyl, propionyl, phenylacetyl, 2-thienylacetyl, 2-furylacetyl, phenoxyacetyl, benzyloxycarbonyl, t-butoxycarbonyl, p-nitrobenzyloxycarbonyl, trityl, p-methoxybenzyl, diphenylmethyl, trimethylsilyl and t-butyldimethylsilyl, A is an anion selected from the group consisting of halogen ions and inorganic acid ions, R_4 is $—COO^-$ or a group $—COOR_5$, and b is 0 when R_4 is $—COO^-$, or b is 1 when R_4 is a group $—COOR_5$, wherein R_5 is a protective group for the carboxyl group, or an acid salt thereof.

5,010,189

PROCESSES FOR THE PREPARATION OF 5-AMINO-4-HYDROXY-VALERIC ACID DERIVATIVES

Peter Herold, Basel, Switzerland, and Christof Angst, Summit, N.J., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 85,437, Aug. 13, 1987, Pat. No. 4,898,977. This application Oct. 24, 1989, Ser. No. 426,927

Claims priority, application Switzerland, Aug. 13, 1986, 3248/86

Int. Cl.[5] C07C *57/03, 265/30*

U.S. Cl. 544—174 **2 Claims**

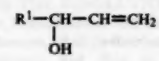
1. Process for the preparation of compounds of the formula T,0720

in which

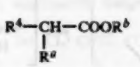
R^1 represents hydrogen, alkyl, hydroxyalkyl, etherified hydroxyalkyl, esterified hydroxyalkyl, haloalkyl, carboxyalkyl, esterified carboxyalkyl, amidated carboxyalkyl, cyanoalkyl, aminoalkyl, mono- or di-lower alkylaminoalkyl, pyrrolidinoalkyl, piperidinoalkyl, morpholinaoalkyl, oxoalkyl, cycloalkyl, cycloalkyl-lower alkyl, aryl, aryl-lower alkyl, 2- methylthioethyl, mercaptomethyl, 3-indolylmethyl, 4-imidazolylmethyl or 3-guanidinopropyl;

R^4 represents hydrogen, alkyl, hydroxyalkyl, etherified hydroxyalkyl, esterified hydroxyalkyl, haloalkyl, carboxyalkyl, esterified carboxyalkyl, amidated carboxyalkyl, cyanoalkyl, aminoalkyl, mono- or di-lower alkylaminoalkyl, pyrrolidinoalkyl, piperidinoalkyl, morpholinoalkyl, oxoalkyl, cycloalkyl, cycloalkyl-lower alkyl, aryl, aryl-lower alkyl, amino, mono- or di-lower alkylamino, aryl-lower alkylamino, lower alkyanoylamino, lower alkoxycarbonylamino, aryl-lower alkoxycarbonylamino, pyrrolidino, piperidino, morpholino, hydroxy, lower alkoxy, lower alkanoyloxy-lower alkoxy, lower alkoxycarbonyloxy-lower alkoxy, aryloxy, aryl-lower alkoxy, lower alkanoyloxy, cycloalkylcarbonyloxy, arylcarbonloxy, tri-lower alkylsilyloxy, mercapto, lower alkylthio, hydroxy-lower alkylthio, arylthio, aryl-lower alkylthic, lower alkanoylthio, lower alkylsulfinyl, hydroxy-lower alkylsulfinyl, arylsulfinyl, aryl-lower alkylsulfinyl, lower alkylsulfonyl, hydroxy-lower alkylsulfonyl, arylsulfonyl, aryl-lower alkylsulfonyl, 2-methylthioethyl, mercaptomethyl, 3-indolylmethyl, 4-imidazolylmethyl, 3-guanidinopropyl or halogen; and

R^c represents hydrogen or lower alkyl, and of salts of these compounds, characterized in that an allyl alcohol of the formula



is reacted with a malonic acid ester of the formula



in which R^a represents a group $COOR^b$ and R^b represents lower alkyl, in the presence of a tetraalkoxy derivative of titanium or zirconium, at temperatures of from 150° to 250° C., and, if desired, the resulting compound of the formula IV in which R^c represents lower alkyl is hydrolyzed with an aqueous base.

5,010,190

CATIONIC COMPOUNDS

Willy Stingelin, Reinach, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

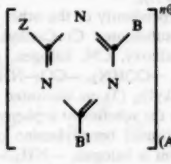
Filed May 9, 1988, Ser. No. 192,316

Claims priority, application Switzerland, May 20, 1987, 1941/87

Int. Cl.[5] C07D *401/04, 403/04*

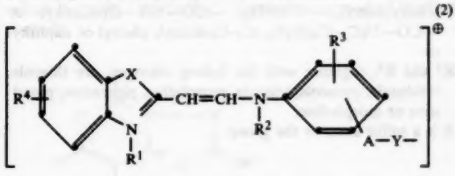
U.S. Cl. 544—198 **15 Claims**

1. A cationic compound of formula



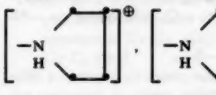
wherein

Z is a radical of formula



B and B^1 are each independently of the other a radical Z, a radical of the formula

or a cationic radical different from Z selected from the group consisting of



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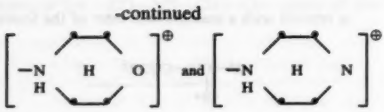
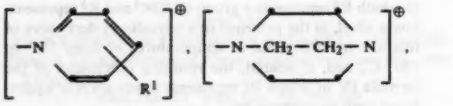
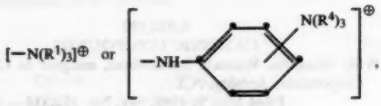




$[-NH(CH_2)_p-N(R^1)_3]^{\oplus}$, $[-NH(CH_2)_p-NH(R^1)_2]^{\oplus}$,



wherein R^1 and R^4 are as defined below and p is 2 or 3,

R^1 is unsubstituted C_1–C_6alkyl or C_3–C_4alkenyl,

R^2 is unsubstituted or substituted C_1–C_6alkyl, wherein the substituent is C_1–C_4alkoxy, CN, halogen, phenyl, alkylphenyl, alkoxyphenyl, —$CONH_2$, —CO—NH—C_1–C_4alkyl or —CO—$N(C_1$–$C_4alkyl)_2$,

R^3 and R^4 are each independently of the other (1) hydrogen, (2) unsubstituted or substituted C_1–C_4alkyl, wherein the substituent is C_1–C_4-alkoxy, CN, halogen, phenyl, alkylphenyl, alkoxyphenyl, —$COHN_2$, —CO—NH—C_1–C_4alkyl or —CO—$N(C_1$–$C_4alkyl)_2$, (3) unsubstituted or substituted C_1–C_4alkoxy, wherein the substituent is phenyl, (4) nitro, (5) unsubstituted or substituted benzoylamino or acetylamin, wherein the substitutent is halogen, —NH_2, —NH—C_1–C_4alkyl or —$N(C_1$–$C_4alkyl)_2$, (6) halogen or (7) —CN,

R^5 and R^6 are each independently of the other hydrogen, unsubstituted or substituted C_1–C_6alkyl, wherein the substituent is C_1–C_4alkoxy, CN, halogen, phenyl, alkylphenyl, alkoxyphenyl, —$CONH_2$, —CO—NH—C_1–C_4alkyl or —CO—$N(C_1$–$C_4alkyl)_2$, C_3–C_6alkenyl, phenyl or naphthyl or

R^5 and R^6, together with the linking nitrogen, are thiazole, imidazole, pyrazole, triazole, pyrrolidine, piperazine, piperidine or morpholine,

X is a sulfur atom or the group

wherein R^7 and R^8 are each independently of the other C_1–C_6alkyl or C_3–C_4alkenyl or can also be linked to each other to form a 5- or 6-membered carbocyclic ring,

A is a direct bond, —NH—C_1–C_4alkylene, —O—C_1–C_4alkylene, C_1–C_4alkylene, phenylene, —O—phenylene or —N-H—phenylene,

Y is —NH—, —NR^1, —O—or —S—,

n is 1, 2 or 3, and

$An^{\ominus}$ is an anion.

5,010,191

IMAGING AGENTS FOR IN VIVO MAGNETIC RESONANCE AND SCINTIGRAPHIC IMAGING

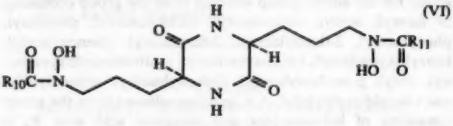
Barry L. Engelstad, Orinda; Kenneth N. Raymond, Berkeley; John P. Huberty, Corte Madera, and David L. White, Oakland, all of Calif., assignors to The Regents of the University of California, Oakland, Calif.

Filed Aug. 19, 1985, Ser. No. 767,214

Int. Cl.[5] C07D *241/08*

U.S. Cl. 544—225 **2 Claims**

1. A metal complex comprising a metal ion complexed with a ligand of the Formula VI:



(VI)

wherein R_{10} and R_{11} are independently alkyl of 1–6 carbon atoms, aryl of 5 to 20 carbon atoms, or OR_{12}, wherein R_{12} is hydrogen or alkyl of 1–6 carbon atoms.

5,010,192

PYRIDAZINONE MANUFACTURE

Michael Yelland, Rossendale, and John Conway, Manchester, both of England, assignors to Imperial Chemical Industries PLC, London, England

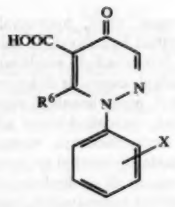
Filed Sep. 13, 1989, Ser. No. 406,338

Claims priority, application United Kingdom, Sep. 13, 1988, 8821449

Int. Cl.[5] C07D *237/24*

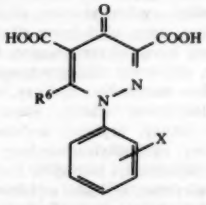
U.S. Cl. 544—239 **4 Claims**

1. Process for recovering a monocarboxylic acid of formula (V):



(V)

from a dicarboxylic acid of formula (IV):



(IV)

where R^6 is H, alkyl or halo, and X represents hydrogen or from one to three substituents (which may be the same or different) selected from alkyl, halo or nitro; which comprises heating the compound (IV) at a temperature in the range 160°–180° C. with 95–100% sulphuric acid for a time sufficient to bring about substantial monodecarboxylation, the weight ratio of (IV) to sulphuric acid used being in the range from about 1:4 to about 1:10.

5,010,193

PREPARATION OF PHOSPHORIC ACID DERIVATIVES AND INTERMEDIATES

Fritz Maurer; Reinhard Lantzsch, both of Wuppertal; Helmut Fiege, and Albert Schnatterer, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

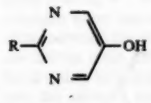
Filed Dec. 9, 1988, Ser. No. 282,712

Claims priority, application Fed. Rep. of Germany, Dec. 18, 1987, 3742983; Jun. 14, 1988, 3820176

Int. Cl.[5] C07F *9/6512*; C07D *239/36, 239/46*

U.S. Cl. 544—243 6 Claims

1. A process for the preparation of a compound of the formula

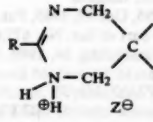


(V)

in which:

R represents hydrogen, alkoxy having 1 to 12 carbon atoms, alkylamino of dialkylamino each having 1 to 6 carbon atoms in each alkyl group, alkyl having 1 to 12 carbon atoms which is unsubstituted or substituted by alkoxy having 1 to 4 carbon atoms or alkylsulphonyl having 1 to 4 carbon atoms in the alkyl group, cycloalkyl having 3 to 8 carbon atoms which is unsubstituted or substituted by alkyl having 1 to 4 carbon atoms, or aryl having 6 to 10 carbon atoms or benzyl which are each unsubstituted or substituted by alkyl, alkoxy or alkylsulphonyl each having 1 to 4 carbon atoms in the alkyl group;

comprising oxidizing a 5-hydroxy-3,4,5,6-tetrahydropyrimidine salt of the formula



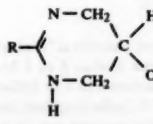
(IV)

in which

Z is chlorine or R^5—CO_2, and

R^5 represents alkoxy, alkylthio, alkylamino or dialkylamino each having 1 to 6 carbon atoms in the aklyl group, or phenyl each being unsubstituted or substituted by one or more substituents independently selected from the group consisting of alkyl, alkoxy, and alkylthio each having 1 to 4 carbon atoms, halogen, cyano, and nitro;

or the corresponding free 5-hydroxy-3,4,5,6-tetrahydropyrimidine of the formula



(IVa)

in the liquid phase in the presence of a solvent and a base at a temperature between about 0° C. and 300° C. using oxygen or an oxygen-containing gas.

5,010,194

METHOD FOR THE RESOLUTION OF FOLINIC ACID

Hans R. Mueller, Schaffhausen; Martin Ulmann, Dachsen; Josef Conti, Schaffhausen, all of Switzerland, and Guenter Muerdel, Tengen-Buesslingen, Fed. Rep. of Germany, assignors to Eprova AG, Schaffhausen, Switzerland

Filed Nov. 7, 1989, Ser. No. 432,819

Claims priority, application Switzerland, Nov. 11, 1988, 04182/88

Int. Cl.[5] C07D *475/04*

U.S. Cl. 544—258 21 Claims

1. A method of separating diastereomers of (6R,S)-folinates, comprising adding a sufficient amount of a water-soluble alkali metal or ammonium salt of an inorganic or organic acid to an aqueous starting solution of an alkali metal or alkaline earth metal salt of (6R,S)-folinic acid at a neutral pH to precipitate the (6R)-folinate, separating off the resultant (6R)-folinate precipitate and isolating the (6S)-folinate from the filtrate.

5,010,195

HERBICIDAL ALKOXY-1,2,4-TRIAZOLO(1,5-C)PRIMIDINE-2-SULFONAMIDES

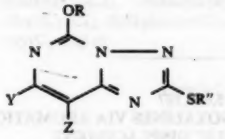
John C. Van Heertum, Concord; Ben C. Gerwick, III, Clayton, and William A. Kleschick, Martinez, all of Calif., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 198,278, May 25, 1988, abandoned. This application May 3, 1989, Ser. No. 347,601

Int. Cl.[5] C07D *487/02*

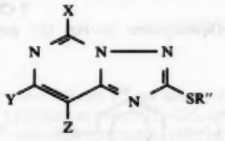
U.S. Cl. 544—263 7 Claims

1. A method of preparing a 5-alkoxy-1,2,4-triazolo 1,5-c]pyrimidine product compound of the formula

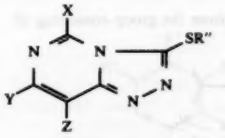


wherein Y and Z each, independently represent OR, H, CH_3, CF_3, Cl, Br, or F; R represents C_1–C_3 alkyl; and R'' represents benzyl or C_2–C_4 alkyl

which comprises combining a starting compound of the first formula



or of the second formula



wherein X represent C_1–C_4 alkylthio; Y and Z each, independently represents OR, H, CH_3, CF_3, Cl, Br, or F; R represents C_1–C_3 alkyl; and R'' represents benzyl or C_2–C_4 alkyl

with a carbonyl or cyano substituted vinyl compound in which the carbonyl or cyano substituent is attached directly to the

vinyl group and that is reactive with C_1–C_4 alkylthiols and a catalytic amount of an alkali metal C_1–C_3 alkoxide in a medium containing the corresponding alcohol and under conditions conductive to the formation of said product compound.

5,010,196

ACYLATED HEXAHYDROPYRIMIDINES

Robin G. Sheperd, Windsor, England, assignor to John Wyeth and Brothers Limited, Maidenhead, England

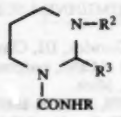
Division of Ser. No. 544,452, Jun. 27, 1990. This application Oct. 2, 1990, Ser. No. 591,594

Claims priority, application United Kingdom, Jun. 30, 1989, 8915131.0

Int. Cl.[5] **C07D** *239/04*

U.S. Cl. 544—335 **2 Claims**

1. A compound of formula



where R is C_{1-6} alkyl or C_{6-10} aryl, wherein the alkyl or aryl group is optionally substituted with one or more groups selected from the group consisting of halogen, hydroxy, lower alkoxy, amino, lower alkylamino, diloweralkylamino, lower acylamino and trifluoromethyl, R^2 is lower alkyl and R^3 is hydrogen or lower alkyl.

5,010,197

POLYPHENYLQUINOXALINES VIA AROMATIC NUCLEOPHILIC DISPLACEMENT

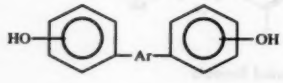
Paul M. Hergenrother, Yorktown, and John W. Connell, Newport News, both of Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Division of Ser. No. 250,661, Sep. 28, 1988, abandoned. Filed Dec. 22, 1989, Ser. No. 454,820

Int. Cl.[5] **C08G** *8/02;* **C07D** *241/36*

U.S. Cl. 544—353 **3 Claims**

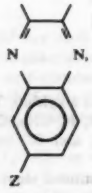
1. A di(hydroxyphenyl)quinoxaline having the general structure:



wherein

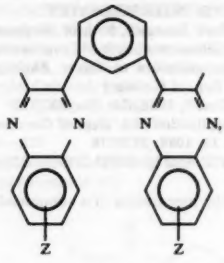
Ar is a radical selected from the group consisting of:

(A)

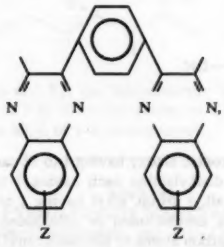


-continued

(B)



(C)



wherein

Z is a substituent selected from the group consisting of: H,F, Cl, Br, CH_3, CH_2CH_3, OCH_3, C_6H_5, and C_6H_5O.

5,010,198

INTERMEDIATES FOR THE SYNTHESIS OF BENZOXAZOL- AND BENZOTHIAZOLAMINE DERIVATIVES, USEFUL AS ANTI-ANOXIC AGENTS

Raymond A. Stokbroekx, Beerse; Marcel G. M. Luyckx, Geel, and Frans E. Janssens, Bonheiden, all of Belgium, assignors to Janssen Pharmaceutica N.V., Beerse, Belgium

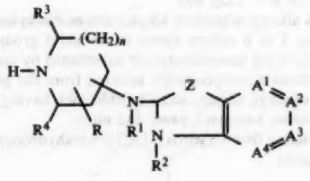
Continuation-in-part of Ser. No. 786,895, Oct. 11, 1985, Pat. No. 4,861,785, which is a continuation-in-part of Ser. No. 677,412, Dec. 3, 1984, abandoned. This application Aug. 24, 1989, Ser. No. 398,212

Int. Cl.[5] **C07D** *471/04, 277/60, 263/58*

U.S. Cl. 546—114 **23 Claims**

1. A compound of the formula:

(III)



a pharmaceutically acceptable acid addition salt, or a possible stereochemically isomeric form thereof, wherein:

$-A^1=A^2-A^3=A^4-$

is a bivalent group of the formula:

$-CH=CH-CH=CH-$ (a);

$-N=CH-CH=CH-$ (b);

$-CH=N-CH=CH-$ (c);

—CH=CH—N=CH— (d); or

—CH=CH—CH=N— (e);

wherein one or two hydrogen atoms in the group

$$-A^1=A^2-A^3=A^4-$$

may, each independently from each other, be replaced by halo, C_{1-6}alkyl, hydroxy, C_{1-6}alkyloxy, or trifluoromethyl;

Z is O or S;

n is 0 or the integer 1;

R is a member selected from the group consisting of hydrogen, C_{1-6}alkyl, hydroxy, or C_{1-6}alkyloxy;

R^1 and R^2 are hydrogen, C_{1-6}alkyl, or Ar-C_{1-6}alkyl, provided that when the dotted line between the nitrogen atom bearing R^1, the intermediate carbon atom, and the nitrogen atom bearing R^2 indicates that a double bond exists between the nitrogen bearing R^1 and said intermediate carbon atom, then R^1 is absent, or when the double bond exists between the said intermediate carbon atom and the nitrogen bearing R^2, then R^2 is absent; wherein said intermediate carbon atom is the carbon atom positioned between the nitrogen bearing R^1 and the nitrogen bearing R^2,

wherein Ar is phenyl optionally substituted with up to three substituents, each such substituent being independently selected from the group consisting of C_{1-6}alkyl, C_{1-6}alkyloxy, halo, trifluoromethyl, cyano, C_{1-6}alkylcarbonyl, nitro, amino, and aminocarbonyl; and

R^3 or R^4 are both hydrogens or R^3 and R^4 combined may form a bivalent group of the formula —CH_2—CH_2—.

5,010,199

Patent Not Issued For This Number

5,010,200

PYRIMIDINE DERIVATIVES

Edward McDonald, Marlow; Roger Salmon, Bracknell; Alan J. Whittle, Twyford, and Michael G. Hutchings, Manchester, all of Great Britain, assignors to Imperial Chemical Industries PLC, London, England

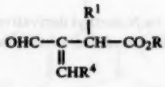
Division of Ser. No. 206,097, Jun. 13, 1988, Pat. No. 4,962,109, which is a continuation-in-part of Ser. No. 942,436, Dec. 16, 1986, Pat. No. 4,762,835. This application Feb. 16, 1990, Ser. No. 485,083

Claims priority, application United Kingdom, Dec. 23, 1985, 8531637; Jun. 17, 1987, 8714233

Int. Cl.[5] **C07D** *295/06, 295/10, 229/00*

U.S. Cl. 546—245 **1 Claim**

1. A compound of formula (VI):



(VI)

wherein R' is selected from alkyl of 1 to 6 carbon atoms; alkenyl of 2 to 8 carbon atoms; alkynyl of 2 to 6 carbon atoms; haloalkyl of 1 to 4 carbon atoms; haloalkenyl of 2 to 8 carbon atoms; and cycloalkyl of 3 to 6 carbon atoms optionally substituted by one or more substituents selected from alkyl of 1 to 4 carbon atoms and halogen; R represents lower alkyl of from 1 to 6 carbon atoms, and R^5 represents alkoxy of from 1 to 6 carbon atoms, dialkylamino wherein each alkyl group is from 1 to 4 carbon atoms, piperidin-1-yl or pyrrolidin-1-yl.

5,010,201

PROCESS FOR THE PREPARATION OF SUBSTITUTED 2-CHLOROPYRIDINES

Dieter Kaufmann, Bergisch Gladbach, and Bernd Gallenkamp, Wuppertal, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

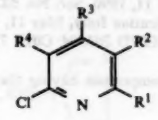
Filed Nov. 1, 1989, Ser. No. 430,389

Claims priority, application Fed. Rep. of Germany, Nov. 22, 1988, 3839332

Int. Cl.[5] **C07D** *213/61*

U.S. Cl. 546—316 **9 Claims**

1. Process for the preparation of substituted 2-chloropyridine derivatives of the formula (I)



(I)

in which

R^1 represents hydrogen, chlorine, cyano, carbalkoxy(C_1–C_4) or

where R^5 and R^6 are identical or different and represent hydrogen or alkyl (C_1–C_4),

R^2 represents hydrogen, chlorine, alkyl(C_1–C_4), halogenoalkyl(C_1–C_4), cyanoalkyl(C_1–C_4), alkoxy(C_1–C_4)-alkyl(C_1–C_4), dialkylamino(C_1–C_4)alkyl(C_1–C_4), carbalkoxy(C_1–C_4) or

where R^5 and R^6 are identical or different and represent hydrogen or alkyl (C_1–C_4)

or where R^1 and R^2 together represent the bivalent group —CH=CH—CH=CH—,

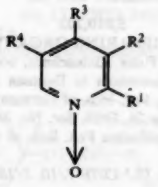
R^3 represents hydrogen, chlorine, carbalkoxy(C_1–C_4) or

where R^5 and R^6 are identical or different and represent hydrogen or alkyl (C_1–C_4), and

R^4 represents hydrogen, chlorine or cyano,

or where R^3 and R^4 together represent the bivalent group —CH=CH—CH=CH—,

wherein pyridine 1-oxides of the formula (II)



(II)

in which

R^1, R^2, R^3 and R^4 have the abovementioned meaning are reacted with a chlorine-containing phosphoric acid deriv-

ative from the series of the chlorophosphoric esters and chlorophosphoramides in the presence of an inert organic solvent and in the presence of an acid acceptor at temperatures between −20° C. and 200° C., and the resulting product is separated further, if appropriate.

5,010,202

NOVEL SILICON-ORGANIC COMPOUNDS, CONTAINING AN OXAZOLIDINE GROUP

Alberto Greco, Desano, Italy, assignor to Enichem Synthesis S. p. A., Palermo, Italy

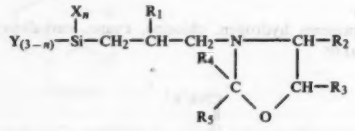
Filed May 11, 1990, Ser. No. 522,218

Claims priority, application Italy, May 11, 1989, 20442 A/89

Int. Cl.[5] C07D *263/04; C07F 7/02*

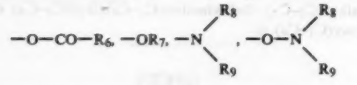
U.S. Cl. 548—110 **5 Claims**

1. Silicon-organic compounds having the general formula (I):



(I)

wherein n is an integer from 0 to 2, X is a hydrogen atom, a linear- or a branched-chain alkyl, or an aryl, y is a hydrolytically labile organic group selected from the groups:



R_1 is a hydrogen atom or a methyl, R_2 and R_3, equal to, or different from one another, are a hydrogen atom, a linear- or a branched-chain alkyl having from 1 to 6 carbon atoms, or an aryl; R_4 and R_5, equal to, or different from one another, are a hydrogen atom, a linear- or branched-chain alkyl or alkenyl containing from 1 to 6 carbon atoms, a cycloalkyl, an aryl, or R_4 and R_5, taken concurrently together with the carbon atom and R_5, taken concurrently together with the carbon atom to which they are bonded, make up a cycloaliphatic ring having from 4 to 8 carbon atoms; R_6 and R_7, equal to, or different from one another, are an alkyl or an alkenyl having from 1 to 6 carbon atoms; R_8 and R_9, equal to, or different from one another, are an alkyl or an alkenyl having from 1 to 6 carbon atoms, a cycloalkyl, an aryl, or R_8 and R_9, taken concurrently together with the adjacent nitrogen atom, make up a saturated 5-membered, 6-membered, 7-membered or 8-membered heterocyclic ring.

5,010,203

METHOD OF PREPARING ORGANYLOXYSILYL

Ulrich Deschler, and Peter Kleinschmit, both of Hanau, Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

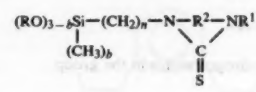
Filed May 26, 1989, Ser. No. 357,723

Claims priority, application Fed. Rep. of Germany, Jun. 25, 1988, 3821464

Int. Cl.[5] C07F *7/10, 7/18*

U.S. Cl. 548—110 **5 Claims**

1. A method of preparing an cyclic N,N,N′ and N,N,N′, N′-substituted organyloxy-functional thiourea having the formula:



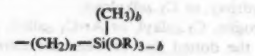
III

in which

n is in the range 1 to 6,

R is alkyl with 1 to 6 carbon atoms, cycloalkyl with 5 to 7 atoms or aryl

R^1 is hydrogen or

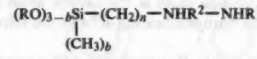


R^2 is alkylene with 1 to 4 carbon atoms or arylene

b is 0, 1 or 2

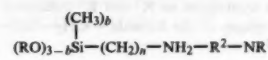
which comprises reacting

(a) An aminopropyl silane of the general formula (I)

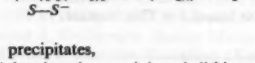


I

in which the substituents have the meanings given above with carbon disulfide in an organic solvent, whereby a dithiocarbamate of the formula (II)



II



II

precipitates,

(b) heating the precipitated dithiocarbamate until no more hydrogen sulfide is released and separating said cyclic N,N,N′ and N,N,N′, N′-substituted organyloxy-functional thiourea.

5,010,204

ACETAZOLAMIDE-RELATED COMPOUNDS, PROCESS FOR THEIR PREPARATION, AND PHARMACEUTICAL COMPOSITION CONTAINING THE SAME

Simonetta Antonaroli; Bianco Armandodariano, both of Rome; Brufani Mario, Castel Gandolfo; Lo Baido Giuseppe, and Rende Giorgio, both of Rome, all of Italy, assignors to Instituto Chimico Internazionale Dr. Giuseppe Rende S.r.l., Rome, Italy

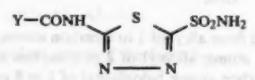
Filed Jul. 18, 1989, Ser. No. 381,453

Claims priority, application Italy, Jul. 29, 1988, 48251 A/88

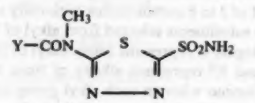
Int. Cl.[5] C07D *285/08*

U.S. Cl. 548—128 **7 Claims**

1. Acetazolamide or its N-methyl derivatives, having inhibiting activity of carbonic anhydrase, of the formulae:

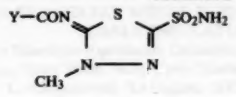


(I)



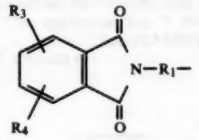
(II)

-continued



(III)

wherein Y is:



wherein R_1 is a straight or branched alkylene or arylalkylene, or a phenylene, R_2 is hydrogen or a straight or branched alkyl possibly substituted with halogen, R_3 and R_4, which can be the same or different from each other, and hydrogen or straight or branched alkyl, and the physiologically acceptable salts thereof.

5,010,205

ANTIHYPERCHOLESTEROLEMIC TETRAZOL-1-YL INTERMEDIATES

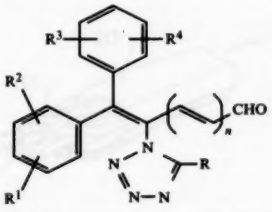
Sing-Yuen Sit, Meriden, and John J. Wright, Guilford, both of Conn., assignors to Bristol-Myers Company, New York, N.Y.

Division of Ser. No. 235,355, Aug. 23, 1988, Pat. No. 4,870,187. This application Jul. 28, 1989, Ser. No. 386,373

Int. Cl.[5] C07D *257/04*

U.S. Cl. 548—253 **5 Claims**

1. A compound of the formula



wherein

R^1, R^2, R^3

and R^4 each are independently hydrogen, halogen, C_{1-4}alkyl, C_{1-4} alkoxy, or trifluoromethyl;

n is zero or 1 and

R is hydrogen, C_{1-4}alkyl or phenyl.

5,010,206

AZOLE DERIVATIVE AND AGRICULTURAL/HORTICULTURAL FUNGICIDE CONTAINING SAID DERIVATIVE AS ACTIVE INGREDIENT

Hiroyuki Enari; Satoru Kumazawa; Susumu Shimizu; Atsushi Ito; Nobuo Sato, and Toshihide Saishoji, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaishi, Japan

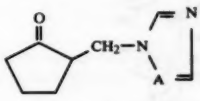
Division of Ser. No. 443,582, Nov. 30, 1989, Pat. No. 4,962,278, which is a division of Ser. No. 129,629, Dec. 7, 1987, Pat. No. 4,902,702. This application Jul. 31, 1990, Ser. No. 560,754

Claims priority, application Japan, Dec. 22, 1986, 1-305908

Int. Cl.[5] C07D *248/08*

U.S. Cl. 548—262.2 **1 Claim**

1. A cyclopentanone derivative represented by the formula (II):



(II)

wherein A represents a nitrogen atom.

5,010,207

PROCESS FOR THE PRODUCTION OF TRIMELLITIC ANHYDRIDE WITH SUPERIOR COLOR PROPERTIES

Chang M. Park, Naperville, Ill., assignor to Amoco Corporation, Chicago, Ill.

Filed Jan. 10, 1990, Ser. No. 463,253

Int. Cl.[5] C07D *307/89*

U.S. Cl. 549—245 **16 Claims**

1. The process for the production of trimellitic anhydride with improved color, the process comprising a treatment of trimellitic anhydride in the presence of a silicon compound selected from the group consisting of colloidal silica and silicic acid activated with an aliphatic acid or anhydride of from 1 to eight carbon atoms, selected from the group consisting of formic acid, acetic acid, propionic acid, 2-ethylhexanoic acid, acetic anhydride, propionic anhydride and maleic anhydride, said treatment at a temperature of from about 200° C. to about 300° C. followed by fractionation at a temperature of about 200° to about 275° C. and a pressure of about 1 to about 25 mm mercury.

5,010,208

NOVEL ALKYLCYCLOALKYL TRIAZOLYLMETHYL KETONES AS FUNGICIDE INTERMEDIATES

Wolfgang Kramer; Manfred Jautelat, both of Burscheid, and Eckart Kranz, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 54,551, May 27, 1987, Pat. No. 4,921,967, which is a continuation of Ser. No. 438,086, Nov. 1, 1982, abandoned. This application Feb. 16, 1990, Ser. No. 482,106

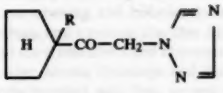
Claims priority, application Fed. Rep. of Germany, Nov. 19, 1981, 3145857

The portion of the term of this patent subsequent to May 1, 2007, has been disclaimed.

Int. Cl.[5] C07D *249/08*

U.S. Cl. 548—267.8 **3 Claims**

1. An alkylcycloalkyl triazolylmethyl ketone of the formula



(I)

in which

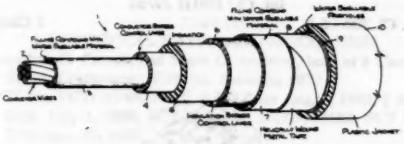
R is methyl or ethyl.

5,010,209

POWER CABLE WITH WATER SWELLABLE AGENTS AND ELONGATED METAL ELEMENTS OUTSIDE CABLE INSULATION

Fabrizio Marciano-Agostinelli, Columbia, S.C.; Marco Barbaro-Forleo, Short Hills, N.J.; Carlo Marin, Vigevano, Italy, and Paul L. Cinquemani, Lexington, S.C., assignors to Pirelli Cable Corp., Florham Park, N.J.

Continuation-in-part of Ser. No. 287,486, Dec. 20, 1988, which is a continuation-in-part of Ser. No. 68,670, Jul. 1, 1987, which is a division of Ser. No. 864,196, May 16, 1986, Pat. No. 4,703,132.
This application Sep. 7, 1989, Ser. No. 404,320
Int. Cl.[5] H01B *7/28*
U.S. Cl. 174—23 C 33 Claims



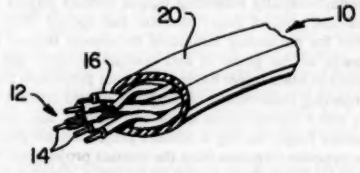
1. An electrical power cable comprising a stranded conductor formed by a plurality of wires stranded together, a semiconductive stress control layer around said conductor, a layer of insulation around said stress control layer, a semi-conductive insulation shield around said insulation, said insulation shield having an outer surface of substantially constant cross-sectional radius and a metal shield which is disposed around said insulation shield and which is one of a helically wound metal tape, a plurality of metal straps and a plurality of metal wires, said metal shield having surfaces extending longitudinally of said cable and being adjacent to each other, and particles of a water swellable material at least at the adjacent surfaces of said metal shield.

5,010,210

TELECOMMUNICATIONS CABLE

Shiraz I. Sidi, Pointe Claire; Paul A. Guilbert, LaSalle; Lise A. Desroches, Boisbriand, and Michel Plasse, Lachine, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Jun. 21, 1990, Ser. No. 541,646
Int. Cl.[5] H01B *11/02*
U.S. Cl. 174—34 3 Claims



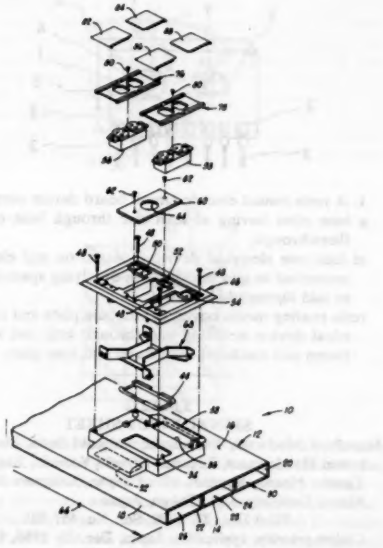
1. An unshielded telecommunications cable having a nominal characteristic impedance of 100 ohms and a core comprising a maximum of six pairs of individually insulated conductor wires, the wire insulation formed from a flame retardant polyolefin base compound and with the insulated conductors of each pair twisted together with the maximum twist lay of 2.3 inches and the core surrounded by a flame retardant jacket.

5,010,211

FLUSHING FLOOR FITTING

Edward C. Bartee, Fairfield, Ohio, assignor to Square D Company, Palatine, Ill.

Filed Jun. 29, 1989, Ser. No. 373,414
Int. Cl.[5] H02G *3/18*
U.S. Cl. 174—48 24 Claims



1. An electrical duct system to be placed in a floor, comprising:

a duct having a bottom wall, a top wall, first and second side walls joining said bottom and top walls, and first and second interior walls dividing an interior of said duct into three parallel cells extending parallel to a length of said duct, said three cells being a central cell and two outer cells, said top wall having a central access opening and two outer access openings defined therethrough and communicated with said central cell and said two outer cells, respectively;

an access unit housing having an open bottom and an open top, said housing being attached to said top wall of said duct so that said open bottom of said housing is communicated with said central and two outer access openings;

a trim ring connected to said open top of said housing and having first, second and third mounting means defined therein for mounting outlet devices therein substantially flush with a surface of said floor, said first, second and third mounting means being aligned in a direction generally parallel to said length of said duct with said second mounting means located in line between said first and third mounting means; and

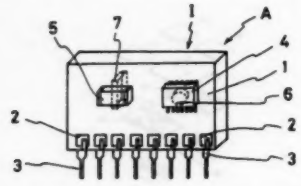
a divider means, located in said housing, for dividing an interior of said housing into spaced first and third chambers, each partially overlying and communicated with said central access opening and isolated from said two outer access openings, and a second chamber extending between said first and third chambers and communicated with both said two outer access openings and isolated from said central access opening, said first, second and third chambers being communicated with said first, second and third mounting means, respectively, of said trim ring.

5,010,212

RESIN COATED ELECTRIC CIRCUIT BOARD DEVICE

Chiaki Sumi, and Wataru Kuwayama, both of Aichi, Japan, assignors to Aisin Seiki K.K., Aichi, Japan

Filed May 30, 1989, Ser. No. 357,929
Claims priority, application Japan, May 31, 1988, 63-134917
Int. Cl.[5] H05K *1/18*
U.S. Cl. 174—52.2 2 Claims



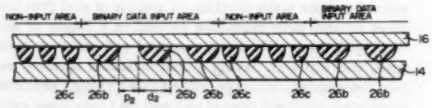
1. A resin coated electric circuit board device comprising:
a base plate having at least one through hole extending therethrough;
at least one electrical device mounted on and electrically connected to said base plate in overlying spaced relation to said through hole; and
resin coating means covering said base plate and each electrical device including said through hole and space between said electrical device and said base plate.

5,010,213

SIGNAL INPUT SHEET

Masafumi Moriwaki, Yamanashi; Shigeaki Sano, Fuchu; Katsunori Hatakeyama, Koganei; Hiroshi Yamada, Koganei, and Youzou Nouno, Koganei, all of Japan, assignors to Toppan Moore Company, Ltd., Tokyo, Japan

Filed Dec. 27, 1989, Ser. No. 457,401
Claims priority, application Japan, Dec. 29, 1988, 63-335494
Int. Cl.[5] G08C *21/00*
U.S. Cl. 178—18 5 Claims



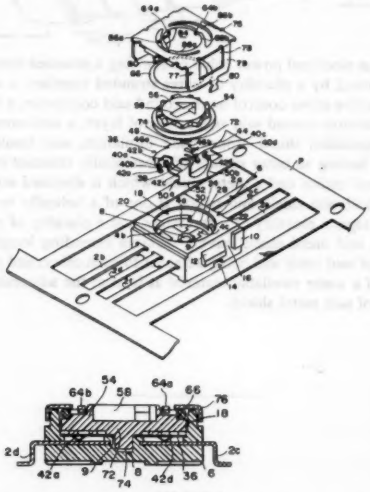
1. A signal input sheet comprising:
a flexible upper laminate having a lower surface and an upper surface, said upper laminate having one of a conductive layer and a resistive layer on its lower surface as a first layer, said upper surface of the upper laminate being divided into at least one hand-written input area for the input of characters and lines and at least one binary data input area for the input of single depressions;
a lower laminate having a lower surface and an upper surface, said lower laminate having one of a conductive layer and a resistive layer on its upper surface as a second layer, where said first layer faces said second layer and at least one of said first layer and said second layer being formed as a resistance layer;
a plurality of insulative spacers interposed between said first layer and said second layer, said insulative spacers arranged at intervals such as to allow an electrical connection between said first layer and said second layer, where a depressing pressure on the upper surface of said upper laminate causes the electrical connection between said first layer and said second layer, said insulative spacers having a larger width in said binary data input area and having a larger spacing between adjacent insulative spacers in said binary data input area;
a voltage source coupled between said first layer and said second layer; and
means for detecting a position at which said depressing pressure is applied on the upper surface of said upper laminate.

5,010,214

ROTARY SWITCH

Atsuo Yamazaki, c/o Iruma Center, Copal Electronics Co., Ltd. No. 110-1, Shimoshinden, Araku, Iruma City, Saitama Prefecture, Japan

Filed Jul. 7, 1989, Ser. No. 376,599
Claims priority, application Japan, Aug. 11, 1988, 63-106294[U]; Aug. 11, 1988, 63-200966; Aug. 23, 1988, 63-110242[U]
Int. Cl.[5] H01H *19/60*
U.S. Cl. 200—6 B 2 Claims



1. A rotary switch, comprising:
a housing having an upwardly open chamber therein and said chamber having a ledge therearound intermediate the depth dimension of said chamber and at least one recess means in said ledge extending in the depth direction of said chamber;
terminal lead fixed contacts in said housing exposed in the bottom of said chamber and spaced from each other;
a planar plate-shaped contact member having a plurality of circumferentially extending output contact fingers and a common contact finger thereon and spaced from each other for permitting individual movement thereof transversely of the plane of said contact member and each output contact finger having a contact projection thereon projecting transversely of the plane of said contact member and a contact point at the end thereof, said common contact finger having a contact projection projecting in the opposite direction from the contact projections of said output contact fingers, and said contact member further having at least one projecting member projecting from the peripheral edge of said contact member, said contact member being in said chamber with said projecting member engaged in said recess means in said ledge and said contact fingers opposed to corresponding terminal lead fixed contacts in the bottom of said chamber with the contact points normally spaced from said terminal lead

fixed contacts and with said contact projection on said common contact finger in contact with one of said terminal lead fixed contacts; and

a rotor rotatably mounted in said chamber and having a circuit board on the under side thereof toward said contact member, said circuit board having cam patterns thereon for engagement with the contact projections on corresponding ones of said contact fingers for causing said contact points on said contact fingers to contact said terminal lead fixed contacts in the bottom of said chamber seriatim as said rotor is rotated, whereby said contact member is held in position in said housing between said rotor and the bottom of said housing and is held against movement within said chamber by the engagement of said projecting member with said recess means.

5,010,215

ELECTRICAL SWITCHING MECHANISM

Jonathon E. Farrell, and Mark C. Anthony, both of 8 Chomley Street, Cranbourne, Victoria, Australia 3977

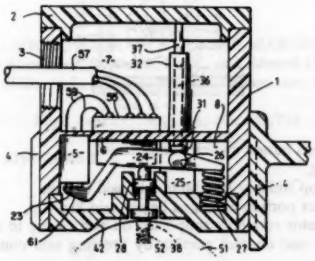
PCT No. PCT/AU88/00405, § 371 Date Aug. 1, 1989, § 102(e) Date Aug. 1, 1989, PCT Pub. No. WO89/03582, PCT Pub. Date Apr. 20, 1989

PCT Filed Oct. 14, 1988, Ser. No. 373,293

Claims priority, application Australia, Oct. 16, 1987, PI4965

Int. Cl.[5] H01H *9/22*

U.S. Cl. 200—50 A **7 Claims**



1. An electrical switching mechanism comprising:

a housing;

an electrical switch mounted in said housing and actuatable from a first circuit state to a second circuit state;

an operator member extending through a wall of said housing for movement inwardly and outwardly with respect to said housing;

a switch actuator mounted within said housing for movement with respect to said housing, said switch actuator being engageable by said operator member for moving said switch actuator, said switch actuator engaging said switch for actuating same;

biasing means coupled to said switch actuator for biasing said switch actuator toward a first position in which said switch is actuated to the first circuit state and said operator member is moved outwardly of said housing by contact with said switch actuator, said operator member being capable of being urged inwardly of said housing by a force external of said housing to move said switch actuator against the bias of said biasing means to a second position for actuating said switch to the second circuit state;

removable access cover means on said housing for providing access within said housing; and

means within said housing engaging said access cover means and said switch actuator which, upon removal of said cover means, allows said biasing means to move said switch actuator into a condition in which said operator member is unable to operate said switch actuator to the second position.

5,010,216

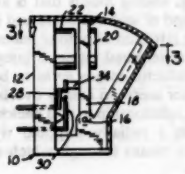
VELOCITY CHANGE SENSORS

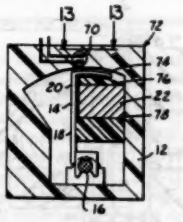
Michael R. Sewell, and Allan W. DeJong, both of Chatham, Canada, assignors to Siemens-Bendix Automotive Electronics Limited, Chatham, Canada

Filed Dec. 21, 1989, Ser. No. 454,674

Int. Cl.[5] H01H *35/14*

U.S. Cl. 200—61.45 M **33 Claims**





1. A velocity change sensor comprising a body, a mass mounted on said body for swinging motion about an axis that lies transverse to the direction in which velocity change is sensed by the sensor, means on said body and said mass, including a permanent magnet, forming a magnetic circuit for biasing said mass about said axis to an initial position from which said mass swings in response to certain velocity changes applied to the sensor, electrical switch means comprising a pair of electrical contacts mounted on said body at least one of which said pair is resiliently held in non-conducting relationship with the other of said pair coincident with occupancy of said initial position by said mass and which assumes a conducting relationship with said other of said pair only after said mass has swung a predetermined arcuate distance from said initial position.

25. A velocity change sensor comprising a body, a mass mounted on said body for swinging motion about an axis that lies transverse to the direction in which velocity change is sensed by the sensor, means on said body and said mass, including a permanent magnet, forming a magnetic circuit for biasing said mass about said axis to an initial position from which said mass swings in response to certain velocity changes applied to the sensor, reed switch means mounted on said body and is operated in response to a predetermined arcuate displacement of said mass from said initial position, said mass comprising a shutter that is interactive with said magnet and said reed switch means for causing operation of said reed switch means.

5,010,217

INERTIA SWITCH MOUNTING HOUSING

Peter Hueniken, Chatham; John A. Gurd, Wallaceburg, and Douglas Woodman, Chatham, all of Canada, assignors to Siemens Automotive Limited, Chatham, Canada

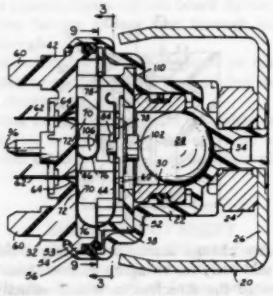
Filed Feb. 26, 1990, Ser. No. 485,342

Int. Cl.[5] H01H *35/14*

U.S. Cl. 200—61.45 R **7 Claims**

1. In an inertia switch assembly of the type in which an inertia switch assembly element is disposed within a mounting housing and at least partially encapsulated therein by potting material, said inertia switch assembly element comprising an enclosure containing both an inertial mass that moves within

said enclosure in response to the inertia switch assembly being subjected to certain velocity change and electrical contacts that are operated by said inertial mass to give a switch signal in response to motion of said inertial mass within said enclosure caused by said certain velocity change, the improvement which comprises said enclosure having an open end that is closed by a closure assembly which includes both a closure and an electrical conductor means via which said electrical contacts are placed in conducting relationship with an electrical terminal means which is accessible from the exterior of said mounting housing, sealing means that is axially captured between said open end of said enclosure and said closure assembly to prevent the intrusion of potting material into said enclosure, said electrical terminal means is integrally formed with said electrical conductor means so as to be disposed by said electrical conductor means in axially overlapping and radially outwardly spaced relationship to said enclosure, said mounting housing comprises a radially disposed wall portion which comprises aperture means through which said electrical conductor means passes to said electrical terminal means, and closure means on said electrical conductor means closing said aperture means.



5. In an inertia switch assembly of the type comprising an inertia switch assembly element disposed within a mounting housing, said inertia switch assembly element comprising an enclosure containing both an inertial mass that moves within said enclosure in response to the inertia switch assembly being subjected to certain velocity change and electrical contacts that are operated by said inertial mass to give a switch signal in response to motion of said inertial mass within said enclosure caused by said certain velocity change, said inertia switch assembly element being of the type comprising a magnetic circuit, including a magnet, that magnetically restrains said inertial mass, the improvement wherein said enclosure is nonmagnetic, a magnetically conductive element that forms a part of said magnetic circuit at least partially envelopes said body, said magnetically conductive element comprises an axially slotted tube having an end wall, and said magnet is axially disposed between said end wall and said body.

5,010,218

FLOAT CONTROLLED SWITCH

Paul P. Reimers, 720 N. Wood St., Valentine, Nebr. 69201

Filed Feb. 9, 1990, Ser. No. 478,840
Int. Cl.[5] H01H *35/18*
U.S. Cl. 200—84 R **8 Claims**

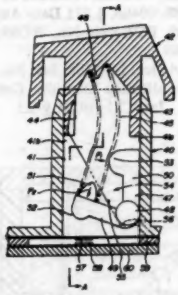
1. A float controlled switch, comprising:
(a) a switch portion;
(b) a float portion being displaced a distance from said switch potion;
(c) a tank, said float portion being disposed in said tank filled with a liquid while said switch portion is disposed outside of said tank so that said switch portion is protected from said liquid;
(d) said float portion includes a hollow circular cylinder with a closed bottom, said hollow circular cylinder containing a hole approximately near said closed bottom of said hollow circular cylinder; and
(e) said switch portion includes a substantially square self contained support, said self contained support being made of plastic and having an end that is tampered into the ground outside the tank so that no holes or clamps are necessary to secure said switching portion to said tank.

5,010,219

PUSH BUTTON SWITCH WITH ACTUATOR FOR APPLYING TRANSVERSE FORCE TO BUCKLING SPRING

Takafumi Kato, Iwaki, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed Jul. 7, 1989, Ser. No. 376,712
Claims priority, application Japan, Jul. 11, 1988, 63-90944[U]
Int. Cl.[5] H01H *13/30*
U.S. Cl. 200—408 **5 Claims**



1. A push button switch comprising:
a casing,
a key top slidably insertable into said casing,
a contact portion arranged below said key top,
an actuator rotatably supported on said casing to open and close said contact portion by pressing said contact portion,
a spring retained with curving in a first orientation between said actuator and said key top,
characterized in that a click portion is provided on said actuator by which a transverse force is applied to an outside portion of said spring at or near a midpoint of said spring when said click portion of said actuator is actuated by downward movement of said key top so as to invert the first curved orientation of said spring.

5,010,220

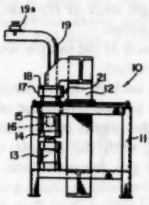
PROCESS AND APPARATUS FOR HEATING BODIES AT HIGH TEMPERATURE AND PRESSURE UTILIZING MICROWAVE ENERGY

Prasad S. Apté, Kingston, and Aniket Pant, Inverary, both of Canada, assignors to Alcan International Limited, Montreal, Canada

Continuation of Ser. No. 308,834, Feb. 9, 1989, abandoned. This application Aug. 30, 1990, Ser. No. 576,164
Claims priority, application Canada, Feb. 16, 1988, 558986
Int. Cl.[5] H05B *6/80*
U.S. Cl. 219—10.55 M **26 Claims**

1. A process of sintering and isostatically compressing a body comprising particles of a sinterable material, which process comprises:
locating said body in a vessel acting as a resonant cavity for microwave radiation of a predetermined frequency, said vessel being able to withstand an internal pressure of at least 20,000 psi at a temperature effective for sintering said particles of sinterable material;
irradiating said body in said vessel with microwave energy

of about said predetermined frequency for a time sufficient to raise the temperature of the body to said temperature effective for sintering said particles of sinterable material; and



raising pressure in said vessel to said pressure of at least 20,000 psi to pressurize said body isostatically.

5,010,221

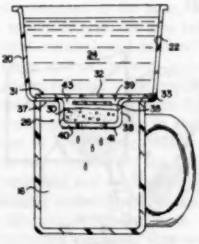
MICROWAVEABLE COFFEE MAKERS

M. Gary Grossman, Riverside, Conn., and Edward H. Meisner, Short Hills, N.J., assignors to GEE Associates, Edgewater, N.J.

Filed Jun. 11, 1990, Ser. No. 535,724

Int. Cl.[5] H05B *6/80*

U.S. Cl. 219—10.55 E **8 Claims**



1. A drip-type coffee maker adapted to discharge freshly brewed coffee, comprising:

a reservoir for holding water to be heated to a temperature for brewing coffee,

a coffee filter element adapted to hold coffee grounds and to receive the heated water from said reservoir and dispense freshly brewed coffee therefrom, and

a partition between said reservoir and said coffee filter element, including a body having at least one aperture therein, a member adapted to cover said aperture, and a non-toxic heat responsive sealing substance adapted to releasably secure said member to the underside of said body and over said aperture to seal said opening until water in said reservoir reaches a temperature for brewing coffee, whereupon said heat responsive substance is adapted to release said member from said body which drops therefrom into said coffee filter element to open said aperture to the flow of heated water therethrough and into said filter element and the coffee grounds to become freshly brewed coffee ready for dispensing from the coffee maker.

5,010,222

DRIVING DEVICE FOR ULTRASONIC WAVE MOTOR

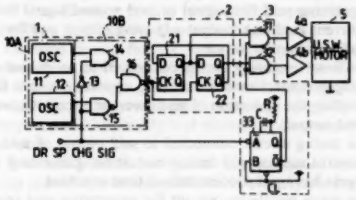
Ryoichi Suganuma, Yokohama, Japan, assignor to Nikon Corporation, Tokyo, Japan

Filed Jun. 5, 1990, Ser. No. 533,410

Claims priority, application Japan, Jun. 8, 1989, 1-146261

Int. Cl.[5] H01L *41/08*

U.S. Cl. 318—116 **7 Claims**



1. A driving device for an ultrasonic wave motor provided with:

a stator member having an electrostrictive member and a resilient member and adapted to generate a travelling vibration wave in said resilient member by excitation with said electrostrictive member; and

a moving member maintained in pressure contact with said stator member and driven by said travelling vibration member; comprising:

drive signal forming means for forming AC voltage signals for high-speed drive and low-speed drive, for application to said electrostrictive member;

wherein said electrostrictive member is excited into vibration by said AC voltage signal;

switch means for selectively switching the AC voltage signals of high-speed drive and low-speed drive for application to said electrostrictive member; and

temporary stop means for reducing the frequency of the AC voltage signal, applied to said electrostrictive member, to zero at least once at the switching from the high-speed drive state to the low-speed drive state.

5,010,223

OUTPUT CONTROL CIRCUIT OF A 4-BURNER ELECTRONICS INDUCTION HEATING COOK SYSTEM AND A CONTROL METHOD THEREOF

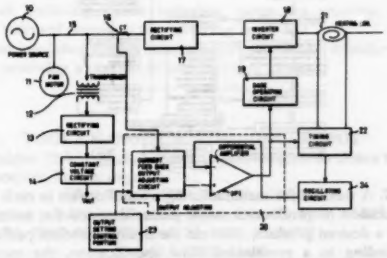
Jeong Y. Kim, Seoul, Rep. of Korea, assignor to Sang Wook Suh International, Seoul, Rep. of Korea

Filed May 31, 1989, Ser. No. 358,809

Claims priority, application Rep. of Korea, May 31, 1988, 6536/88

Int. Cl.[5] H05B *6/08*

U.S. Cl. 219—10.77 **3 Claims**



1. A system for controlling the output of an electronic induction heating cook system, the system comprising;

(1) means for rectifying the AC current of a power source;

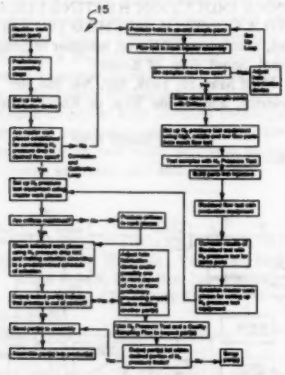
(2) an invertor circuit connector to said rectifying means for applying a frequency voltage to at least one heating coil;
(3) an output control means provided with a current feedback/output adjusting circuit and a pulse width modulation circuit, said current feedback/output adjusting circuit for monitoring a detected current from said power source and for outputting either a first signal if said detected current is more than a predetermined value or a second signal if the detected current is less than said predetermined value, and said pulse width modulation circuit for receiving said first signal or said second signal from said current feedback/output adjusting circuit and for receiving a triangular wave;
(4) a base operating means connected to an output of said output control means, said base operating means for controlling the operation of said invertor circuit according to said output;
(5) a timing circuit connected to said output of said output control means, said timing circuit for generating a pulse cycle having a predetermined time constant;
(6) a wave oscillating circuit for generating said triangular wave corresponding to said pulse cycle of said timing circuit; and
(7) an output setting control portion connected to said feedback/output adjusting circuit, said output setting control portion for setting said predetermined value via a selecting key corresponding to a desired heating level for said at least one heating coil, said output setting control portion comprising a microprocessor for generating a predetermined output according to a selection of said selecting key and comprising a decoder connected to said microprocessor for receiving said predetermined output and for optically controlling photocouplers connected in parallel to said decoder in a logical OR configuration, and said photocouplers for adjusting said predetermined value.

5,010,224

VERY SMALL ORIFICE MANUFACTURING SYSTEM

Roy D. Shirey, Laurens; Michael T. Nelson, and Robert J. Laurenzi, both of Taylors, all of S.C., assignors to Lucas Industries, plc, United Kingdom

Filed Jun. 12, 1989, Ser. No. 365,258
Int. Cl.[5] B23H *9/14, 7/20*
U.S. Cl. 219—69.17 **21 Claims**



17. A method for manufacturing a small orifice in each of a succession of production work pieces destined for assembly into a desired product, wherein the desired product performs according to a preselected flow specification, the method comprising the steps of:

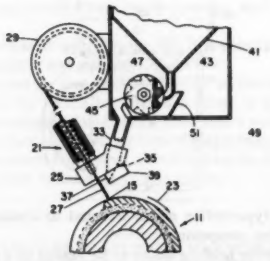
(a) establishing a correlation between the desired flow performance of the production work piece and a test gas pressure associated with the flow through the orifice of the production work piece by the steps including:
(i) machining an orifice through each work piece in a group including about 30 sample work pieces,
(ii) taking gas pressure data associated with the flow of the test gas through each of the machined orifices of the sample work pieces,
(iii) assembling each of the sample work pieces into at least one desired product,
(iv) test flowing each of the assembled products with the actual fluid or a close simulation of the actual fluid, and
(v) correlating the results of the fluid tests of the assembled products with the sample workpieces with the results of the gas pressure tests of the unassembled sample workpieces to produce a correlation of test gas pressure values versus fluid flow values for the desired product;
(b) machining an orifice through each production work piece;
(c) connecting a test gas pressure source via a gas pressure gauge to discharge through said orifice of each said production work piece chosen according to a statistical process control plan;
(d) measuring on said gauge the gas pressure measurement related to flow through each said orifice so chosen; and
(e) using said correlation and said gauge pressure measurement to determine whether said chosen orifice satisfies the preselected flow specification.

5,010,225

TOOL JOINT AND METHOD OF HARDFACING SAME

Frank J. Carlin, Houston, Tex., assignor to Grant TFW, Houston, Tex.

Filed Sep. 15, 1989, Ser. No. 408,074
Int. Cl.[5] B23K *9/04*
U.S. Cl. 219—76.12 **9 Claims**



1. A method of applying grooved bands of hardsurfacing on a tool joint for earth boring drill pipe, the hardfacing having tungsten carbide granules in an alloy steel matrix, the method including the steps of rotating the tool joint, providing an arc between an electrode and the tool joint to create a weld puddle, reciprocating the electrode parallel to the tool joint axis, and feeding granules into the weld puddle, the improvement comprising:

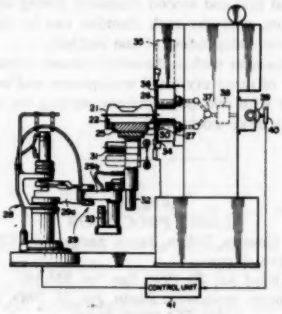
(1) applying the weld puddle within a groove around the exterior of the tool joint to a groove depth of from between about 0.75 inches to about 0.150 inches;
(2) discontinuing the feed of the granules into the weld puddle; and
(3) continuing the application of the weld puddle around the tool joint and in the grooves to provide a protruding substantially tungsten carbide free hardfacing surface above the outer diameter of the tool joint of from between about 0.050 inches to about 0.175 inches.

5,010,226

AUTOMATIC SEAM WELDING APPARATUS

Kazuhiro Sato; Tomomi Kishi; Koji Umeda; Yasushi Uchida, and Masahiko Takeuchi, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Sep. 6, 1989, Ser. No. 403,400
Claims priority, application Japan, Sep. 28, 1988, 63-240678
Int. Cl.[5] B23K *11/06*
U.S. Cl. 219—81 12 Claims



1. An apparatus for seam welding overlapping peripheral flange portions of two workpieces disposed one on top of the other to form a tank, the apparatus comprising:

a base;

a pair of roller electrodes rotatably mounted to the base, the electrodes having opposing peripheral surfaces for nipping and seam welding the overlapping peripheral flange portions of workpieces disposed therebetween;

means for sensing the diameter of one of the roller electrodes;

a jig for holding the two disposed workpieces;

a robot assembly mounted to the base, the robot assembly including an articulate arm, the arm being manipulatable in the horizontal, vertical, and inclined planes, means for moving the outer end of the arm in horizontal, vertical and inclined planes relative to the opposing surfaces of the pair of electrodes for maintaining the flange of the tank in the desired welding orientation in accordance with the sensed diameter of said roller electrode and regardless of the inclination and variation of the flange portion of the tank in the horizontal and vertical planes;

means for detachably and rotatably mounting the jig to the outer end in the bore of the arm; and

control means including means for seam welding the peripheral flange portions of workpieces held by the jig during feeding of the flange portions between the opposite electrode surfaces.

5,010,227

SOLDERING APPARATUS AND METHOD OF USING THE SAME

Thomas W. Todd, 10515 Earthstar Ct., San Diego, Calif. 92127

Filed Feb. 15, 1989, Ser. No. 311,655
Int. Cl.[5] B23K *1/02, 11/30;* H05B *3/42*
U.S. Cl. 219—85.16 20 Claims

1. A soldering apparatus including a soldering head, comprising:

thermod means for heating uniformly a solder material to form a substantially uniform solder joint;

said thermod means including conductor means for transferring thermal energy to said solder material, said conductor means being generally a thin flat elongated plate composed of a thermally conductive electrically insulative material;

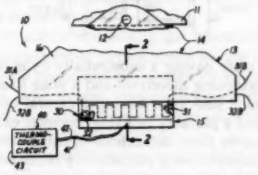
said thermod means including a pair of first and second heating elements for converting electrical energy to thermal energy to heat said plate to soldering temperatures;

said heating elements being disposed on opposite sides of said flat plate at a substantial distance from the bottom edge thereof;

said thermod means further including a pair of first and second elongated spacing members, each one being interposed between said plate and one of respective first and second heating elements for isolating electrically said heating elements from said plate to inhibit electrical current from flowing in said plate and for permitting heat flow from said heating elements to said plate;

said thermod means further including a pair of first and second heat confining elongated members for directing the thermal energy generated by said heating elements toward said plate, said heat confining members being composed of a thermally and electrically non-conductive material;

said first and second heat confining elongated members being spaced apart on opposite sides of said plate engaging



the respective first and second heating elements for directing the thermal energy generated thereby toward said plate;

said plate depending downwardly between said first and second spacing members terminating in a bottom edge having a substantially flat surface throughout its entire longitudinal length for transferring uniformly thermal energy to said solder material;

holding means disposed in a spaced apart manner relative to said conductor means for securing the conductor means and the heating means relative to the soldering head and for thermally insulating the soldering head from said heating means and said conductor means;

wherein said holding means includes insulating means for electrically and thermally insulating said thermod means from the soldering head;

said insulating means including means for securing said thermod means to the soldering head; and

said insulating means being an elongated block member for receiving a portion of said thermod means.

5,010,228

TOOL CHANGER FOR WELDING ROBOT

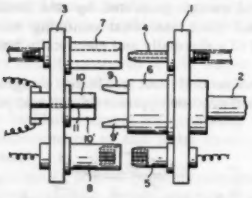
Toshihiro Nishiwaki, Kanagawa, Japan, assignor to Obara Corporation, Tokyo, Japan

Filed Dec. 9, 1988, Ser. No. 282,601
Claims priority, application Japan, Dec. 28, 1987, 62-329426; Feb. 16, 1988, 63-31823; Oct. 25, 1988, 63-26705
Int. Cl.[5] B23K *11/00*
U.S. Cl. 219—86.25 5 Claims

1. A tool changer for a welding robot, comprising:

a first base plate associated with a robot arm and a second

base plate associated with a tool member, a plurality of first connector parts supported on said first base plate, said first connector parts being adapted to supply at least one of fluid and electricity to the tool member from the robot arm, a plurality of second connector parts supported on said second base plate, said second connector parts being adapted to receive at least one of fluid and electricity from said first connector parts, each said first connector part being adapted to mate with and form a connection with a respective said second connector part, said connector parts being arranged such that respective pairs of said connector parts mate when said base plates are disposed in a predetermined relationship adjacent one another, each



said base plate having a substantially cylindrical coupler element extending therefrom and a yoke fixedly attached thereto, each said yoke having a central opening therethrough and a plurality of fixing elements extending radially outwardly from said central opening, said cylindrical coupler elements being respectively received in said central openings of said yokes, at least some of said first connector parts being carried in groups on platelike first connector units which are detachably mounted on respective said fixing elements associated with said first base plate, and at least some of said second connector parts being carried in groups on platelike second connector units which are detachably mounted on respective said fixing elements associated with said second base plate.

5,010,229

APPARATUS FOR ELECTRON BEAM WELDING OF WORKPIECES

Hans Lamatsch, Heroldsberg, and Dieter Vanek, Nüremberg, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

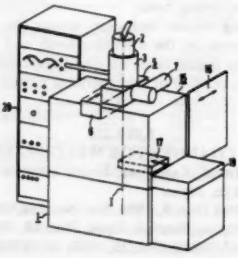
PCT No. PCT/DE88/00732, § 371 Date May 24, 1990, § 102(e) Date May 24, 1990, PCT Pub. No. WO89/05206, PCT Pub. Date Jun. 15, 1989

PCT Filed Nov. 25, 1988, Ser. No. 477,958

Claims priority, application Fed. Rep. of Germany, Nov. 30, 1987, 3740552

Int. Cl.[5] B23K *15/00*

U.S. Cl. 219—121.21 **5 Claims**



1. An apparatus for welding workpieces with electrons comprising:

an electron beam generator having a beaming direction axis;

a first workpiece chamber having a small volume and a second workpiece chamber having a large volume connected to one another via a slide valve located in the beaming direction axis region;

a vacuum pump for evacuating said first and second chambers, said vacuum pump being coupled only to said first chamber having said small volume;

said first chamber having said small volume being adjacent to said electron beam generator and said second chamber having said large volume following adjacent to said first chamber;

each of said first and second chambers having separate access doors, whereby each chamber can be loaded with workpieces independent of one another;

said first chamber with said smaller volume serving for fast welding of relatively small workpieces, and said second chamber with said large volume serving for welding of relatively large workpieces.

5,010,230

LASER PROCESSOR

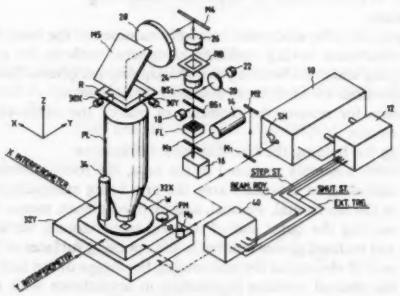
Tsunesaburo Uemura, Tokyo, Japan, assignor to Nikon Corporation, Tokyo, Japan

Filed Jul. 20, 1990, Ser. No. 554,840

Claims priority, application Japan, Jul. 24, 1989, 1-190862

Int. Cl.[5] B23K *26/00*

U.S. Cl. 219—121.62 **2 Claims**



1. In a laser processor provided with a pulse oscillating laser light source, excitation means for exciting said laser light source in response to a trigger signal for pulse oscillation, beam quality adjusting means for adjusting a beam quality of a laser light within a preset standard as monitoring the pulse-oscillated laser light at least partly, a working apparatus for exposing or processing a workpiece by projecting the adjusted laser light thereon, the improvement comprising:

a screening member for cutting off an optical path of said laser light to the workpiece when said working apparatus interrupts an operation using said laser light for a predetermined period of time or over;

trigger control means for impressing said trigger signal on said excitation means in a low frequency band necessary for said beam quality adjusting means to stabilize a beam quality of said laser light while the screening member cuts off the optical path;

abnormal detecting means for generating a quality abnormal signal when detecting a beam quality of said laser light coming under a standard necessary for said exposure or processing;

correction means for keeping a cut-off operation of said screening member when the quality abnormal signal is generated, and correcting a frequency band of the trigger signal to be impressed on said excitation means to the low frequency band set by said trigger control means or over.

5,010,231

METHOD OF FORMING LINES OF WEAKNESS IN OR GROOVING A PLASTIC MATERIAL, ESPECIALLY A PACKAGING MATERIAL

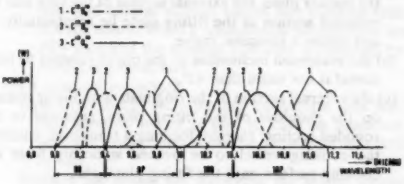
Gert J. Huizinga, Leeuwarden, Netherlands, assignor to LPF Verpakkingen B.V., Netherlands

Filed May 17, 1990, Ser. No. 525,246

Claims priority, application Netherlands, May 19, 1989, 8901257

Int. Cl.[5] B23K *26/00*

U.S. Cl. 219—121.69 4 Claims



1. A method of forming lines of weakness in or grooving a plastic material, especially a packaging material, by local vaporization or degradation by means of a laser beam, which laser beam and which plastic or packaging material can be moved in relation to each other, characterized in that the laser beam is generated by means of a wavelength tunable laser tuned to a wavelength selected on the basis of the wavelength depending absorption spectrum of the material to be processed.

5,010,232

METHOD OF AND APPARATUS FOR PERFORATING PRINTED CIRCUIT BOARD

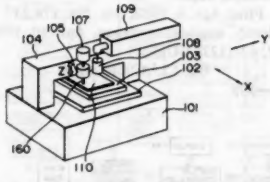
Kunio Arai, Atsugi, and Yasuhiko Kanaya, Machida, both of Japan, assignors to Hitachi Seiko, Ltd., Ebina, Japan

Filed Jan. 23, 1990, Ser. No. 468,914

Claims priority, application Japan, Jan. 27, 1989, 01-016157

Int. Cl.[5] B23K *26/00*

U.S. Cl. 219—121.7 14 Claims



1. A method of perforating a printed circuit board having a copper foil layer on one side thereof, at least one intermediate resin layer and a layer on the other side thereof, so as to form a connection hole for providing an electrical connection between said copper foil layer and said layer on the other side of said printed circuit board, said method comprising:

preparing a printed circuit board perforation apparatus which has a laser processing head capable of processing said printed circuit board by means of a laser beam and a drill head capable of drilling said printed circuit board;

conducting drilling into said resin layer through said copper foil layer by said drilling head so as to form a pilot hole; and

irradiating through said pilot hole a laser beam by said laser processing head to the portion of said resin layer remaining at the bottom of said pilot hole so as to remove the resin, thereby forming said connection hole reaching said layer on the other side of said printed circuit board.

5,010,233

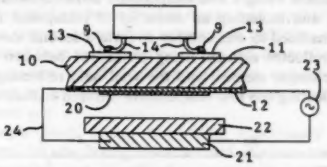
SELF REGULATING TEMPERATURE HEATER AS AN INTEGRAL PART OF A PRINTED CIRCUIT BOARD

Homer E. Henschen, Carlisle; Michael J. McKee, New Cumberland, and Joseph M. Pawlikowski, Lancaster, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Nov. 29, 1988, Ser. No. 277,095

Int. Cl.[5] H05B *3/12, 6/10*

U.S. Cl. 219—209 19 Claims



1. An article containing portions to be heated by delivery of sufficient thermal energy to at least one connection site to melt electrically-conductive fusible material at the connection site, said apparatus comprising:

a support structure comprising an electrically-insulative thermally conductive circuit board having first and second opposite board surfaces spaced by a board thickness dimension, with at least one contact pad secured to said circuit board at said connection site, said pad being disposed on said first board surface;

a selectively energizable self-regulating heater for generating said sufficient thermal energy, said heater having a thermally-conductive portion permanently secured to said support structure in spaced proximity to said connection site to permit thermal energy generated by said heater to be conducted to said connection site through the circuit board, said heater having a substrate of electrically and thermally conductive non-magnetic substrate material having first and second opposite surfaces, the substrate disposed over the entirety of said second surface of said circuit board and secured to said circuit board with the second substrate surface against the second board surface, a surface layer of magnetic surface layer material affixed to said substrate on less than the entirety of said first substrate surface, said surface layer aligned with said pad through the thickness of said circuit board, said surface layer material being electrically and thermally conductive but having a much greater electrical resistance than said substrate material, wherein said self-regulating heater is energizable by passing a constant amplitude alternating current of known frequency therethrough and the depth of said surface layer on said first surface of said substrate is approximately one skin depth at said known frequency, whereby current through said heater is concentrated in said surface layer at temperatures below the Curie temperature of said surface layer material and expands into said substrate material at temperatures equal to and above said Curie temperature.

5,010,234

DEVICE FOR AIR-CONDITIONING PREMISES WITH EXCHANGE OF HEAT ENERGY BY LOW TEMPERATURE INFRARED RADIATION

Fernand Scherrer, 2 rue Georges Bizet, 68170 Rixheim, and Joseph Rousset, 22 rue des Ecoles, 75005 Paris, both of France

Filed Dec. 2, 1988, Ser. No. 279,432

Claims priority, application France, Dec. 4, 1987, 87 16891; Jun. 23, 1988, 88 08461

Int. Cl.[5] H05B *3/34*

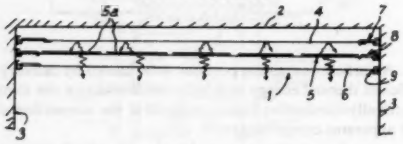
U.S. Cl. 219—213 20 Claims

1. A device for air-conditioning premises, with exchange of heat energy by low temperature infrared radiation, comprising:

three suspended elements, the first suspended element being a reflector element, the second suspended element being a flat heat exchanger element, and the third suspended element being a first sheet;

said flat heat exchanger element exchanging heat energy by low temperature infrared radiation, said flat heat exchanger element extending parallel to a wall of the room and being spaced therefrom, said flat heat exchanger element being a low temperature infrared radiation emitter and including an assembly of juxtaposed individual films fixed to one another to form a second sheet;

said reflector element being positioned between said heat exchanger element and the wall, said reflecting element reflecting the low temperature infrared radiation;



said individual films being fixed on an incombustible cloth having a weft permitting optimum passage of the infrared radiation, said cloth having a mesh such that the nature and dimensions thereof are such that in the event of a fire affecting said films, the association by adhesion or welding of said films on the incombustible support cloth limits the propagation of the flames and avoids the melting material dropping onto the occupants of the premises, by retention in the meshes of the weave of the cloth;

said first sheet facing and being disposed towards the interior of the room and being stretched across the room, said first sheet being made of a material behaving in a diathermic manner with respect to the low temperature infrared radiation, said heat exchanger element and said reflector element; and

means hooking each of said first and said second sheets along their edges to walls of the room.

5,010,235

ELECTRIC COOKER PLATE

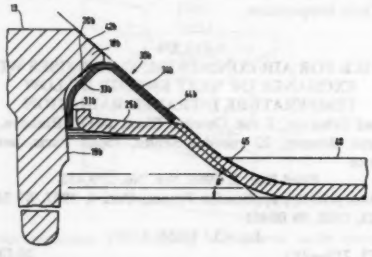
Karl Fischer, deceased, late of Oberderdingen; Gerhard Borst, executor, Esslingen-Liebersbronn; Heinz Treffinger, executor, and Dorothee Fischer, executrix, both of Oberderdingen, all of Fed. Rep. of Germany, assignors to E.G.O. Elektro-Gerate Blanc u. Fischer, Oberderdingen, Fed. Rep. of Germany

which is a continuation-in-part of Ser. No. 968,047, Dec. 8, 1978, abandoned. This application Apr. 28, 1989, Ser. No. 345,111

Claims priority, application Fed. Rep. of Germany, Dec. 14, 1977, 2755806; Dec. 14, 1977, 2755807

Int. Cl.[5] H05B *3/70*

U.S. Cl. 219—455 **13 Claims**



1. An electric cooker comprising:

a fitting plate having an opening surrounded by an upwardly directed rim, the rim being surrounded by a shoulder and the shoulder being surrounded by a rounded section;

a cooker plate disposed in the opening and having a cooking surface on which a cooking vessel can be stood; and,

a sheet metal ring surrounding the cooker plate, and projecting beyond the cooker plate, the ring having an irregular U-shaped cross-section with a radial internal section fixed to the outer rim surface of the cooker plate, and a radial external section which overlaps the rim of the fitting plate, wherein:

(a) the external section of the sheet metal ring is arranged and bevelled in such a way that the outermost edge of the cooker plate, the external section of the ring and the rounded section of the fitting plate lie substantially on and define a common curve,

(b) the maximum inclination of the curve relative to horizontal is not more than 45°,

(c) the external section of the ring rests with linear contact on the shoulder of the fitting plate, adjacent to the rounded section; thereby forming a transition, enabling the cooking vessel to be pushed smoothly from the cooking surface onto the fitting plate, and

(d) the height of the ring is less than 5 mm.

5,010,236

Patent Not Issued For This Number

5,010,237

IC CARD SYSTEM FOR PREVENTING UNAUTHORIZED DATA ALTERATION

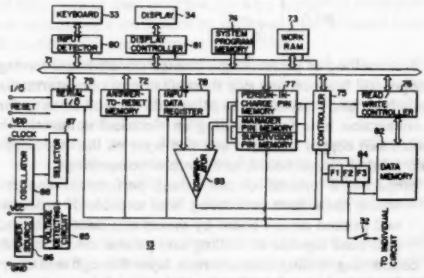
Shigeyuki Kawana, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Apr. 6, 1988, Ser. No. 178,237

Claims priority, application Japan, Apr. 10, 1987, 62-87070; Jul. 24, 1987, 62-112703[U]

Int. Cl.[5] G06F *15/30*

U.S. Cl. 235—379 **15 Claims**



1. An IC card system having an IC card and a terminal unit used for processing transaction data generated in association with use of said IC card, said system comprising:

(a) an IC card including:

memory means for storing at least first PIN (personal identification number) data and second PIN data;

input means for entering PIN data;

collation means for comparing PIN data from said input means with said first and second PIN data stored in said memory means to detect coincidence therebetween;

data memory means for storing data inputted from said terminal unit;

first and second storage means for respectively storing first and second permission data each of which represents an allowable operation of said terminal unit;

control means for inputting said first permission data into said first storage means and clearing said second storage means when a coincidence between the first PIN data and the entered PIN data is detected by said collation means, and for inputting said second permission data into said second storage means and clearing said first storage means when a coincidence between the second PIN data and the entered PIN data is detected by said collation means; and

(b) a terminal including:

data input means for inputting transaction data into said data memory means of said IC card on condition that said first storage means has the permission data stored in it; and

transferring means for retrieving the stored transaction data from said data memory means of said IC card and transferring the retrieved transaction data to a host computer coupled thereto on condition that said second storage means has the second permission data stored in it.

5,010,238

AUTOMATIC CASH TRANSACTION SYSTEM AND METHOD

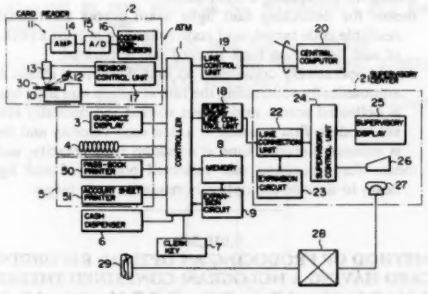
Osamu Kadono, Kasugai, and Kunio Ushizima, Seto, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 31, 1989, Ser. No. 304,095

Claims priority, application Japan, Mar. 18, 1988, 63-63278; Apr. 15, 1988, 63-93123

Int. Cl.[5] G06F *15/30*

U.S. Cl. 235—379 **16 Claims**



1. An automatic cash transaction system comprising a plurality of automated teller machines and a supervisory center for supervising the automated teller machines, wherein cash transactions are performed using an identification card which stores an index representative at least of the number of a user's account,

each of said plurality of automated teller machines comprising:

guidance display means for displaying a guidance such as a transaction operation guidance;

optical information reading means for taking a surface image information of said identification card as a digital information;

operation means for inputting necessary data for a current transaction operation, and designating a particular past transaction;

data storing means for digitally storing for each transaction the surface image information of said identification card obtained by said optical information reading means and said corresponding transaction information including said data inputted from said operation means as an electronic journal; and

control means for reading out the surface image information of an identification card associated with a past transaction information stored in said data storing means designated by said operation means to display said surface information on said guidance display means, and capable of sending a current transaction information including said data inputted from said operation means and the surface image information of said identification card to said supervisory center when said control means detects a transaction failure; and

said supervisory center comprising supervisory display means for displaying thereon said current transaction information and identification card surface information sent from said control means, and supervisory control means for reading out said electronic journal of past transaction stored in said data storing means to display on said supervisory display.

5,010,239

IC CARD READER/WRITER

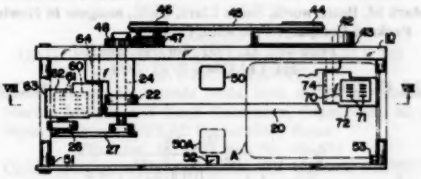
Katsuya Mita, Kyoto, Japan, assignor to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Oct. 4, 1988, Ser. No. 253,036

Claims priority, application Japan, Oct. 9, 1987, 62-155056[U]

Int. Cl.[5] G06F *7/06*

U.S. Cl. 235—441 **3 Claims**



1. An IC card reader/writer comprising:

an IC card inserting port:

an IC card conveying apparatus extending from said IC card inserting port to an inside of the IC card reader/writer;

a first connector having contact members and disposed near one end of said IC card conveying apparatus, the first connector being adapted to electrically connect with an IC card of first kind of format; and

a second connector having contact members and disposed near other end of said IC card conveying apparatus, the second connector being adapted to electrically connect with an IC card of second kind of format.

5,010,240

COMPOSITE TICKET PROCESSING UNIT

Dunstan P. Sheldon, Altadena, Calif., assignor to Mag-Tek, Inc., Carson, Calif.

Filed Apr. 11, 1989, Ser. No. 336,401

Int. Cl.[5] G06K *5/00, 7/00*; G06F *15/20*; B26D *7/06*

U.S. Cl. 235—382 **10 Claims**

1. A terminal for processing composite documents severable into plural sections, as including a ticket and a pass, said documents having a machine-readable record as a magnetic stripe, said terminal comprising:

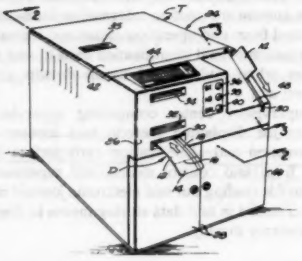
a housing defining a document input port, at least one exit port, at least one collection bin, and a channel slot for guiding the movement of a passing document section;

document track means affixed in said housing to transport

document sections from said input port alternatively to a collection bin or an exit port;

a sensor fixed in said housing in the proximity of said track means to read and process data from said document sections;

a document burster affixed contiguous to said track means at a location beyond said sensor for separating said document into sections;



a second sensor affixed contiguous to said channel slot to read and process one of the document sections separated by the burster as it passes through said channel slot; and

a control unit connected to said first and second sensors to control said track means, said burster and to provide indications of document acceptability.

5,010,241

SENSOR ARRAY AND ILLUMINATION SYSTEM FOR A LARGE DEPTH-OF-FIELD BAR CODE SCANNER

Mark M. Butterworth, Santa Clara, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jan. 12, 1989, Ser. No. 296,997

Int. Cl.[5] G06K *7/10, 7/14*

U.S. Cl. 235—462 **42 Claims**

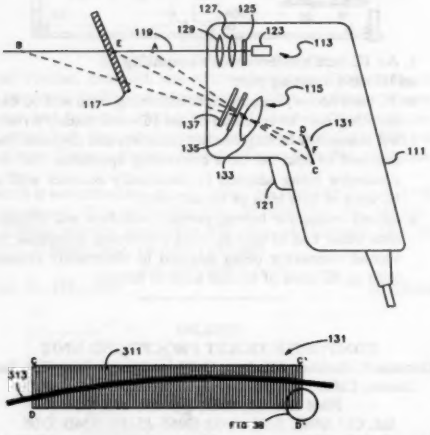


FIG 3B

1. An optical system for a bar code scanner for reading a bar code tag, comprising:

a focusing means having an optical axis;

illumination means for projecting a sheet of light along an object plane at a first acute angle with respect to a plane perpendicular to the optical axis of the focusing means, for illuminating a strip on the bar code tag to be read; and

a detector array for receiving light reflected from the bar code tag, with a plurality of elements having a long axis and a short axis, positioned substantially in an image plane at a second acute angle with respect to a plane perpendicular to the optical axis of the focusing means, with the long axis of the elements arranged substantially perpendicular to the image of the illuminated strip of the bar code tag, the projection of the long axis of the elements of the detector array onto the object plane defining the working range of the optical system;

a plane through the focusing means perpendicular to the optical axis of the focusing means, the image plane and the object plane all intersecting along a line so that an image of the illuminated strip of the bar code tag is formed substantially in focus on the detector array when the bar code tag is within the working range of the optical system.

5,010,242

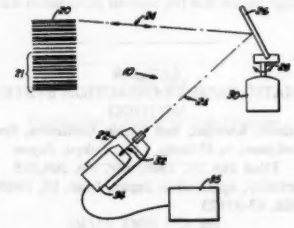
METHOD AND APPARATUS FOR VARIABLE SPEED SCANNING OF BAR CODES

Louis J. Frontino, Cherry Hill, N.J., assignor to Mars Incorporated, McLean, Va.

Filed May 8, 1989, Ser. No. 349,090

Int. Cl.[5] G06K *7/10*

U.S. Cl. 235—467 **27 Claims**



1. An apparatus for variable speed scanning of an optically readable code, comprising:

means for generating a light beam;

means for deflecting said light beam across an optically readable code target, said code reflecting at least a portion of said light beam back toward said apparatus;

means operatively connected to said deflecting means for automatically controlling the rate at which said light beam is deflected across said object so that the optically readable code is first scanned at a first scan velocity and then is scanned a second time at a second scan velocity; and

means for processing said reflected portion of said light beam to decode the optically readable code target.

5,010,243

METHOD OF PRODUCING AN OPTICAL RECORDING CARD HAVING A HOLOGRAM CONTAINED THEREIN

Yoichi Fukushima; Minoru Fujita; Yuji Kakinuma, and Toshio Haga, all of Tokyo, Japan, assignors to Kyodo Printing Co., Ltd., Tokyo, Japan

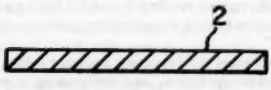
Division of Ser. No. 108,473, Oct. 14, 1987, Pat. No. 4,945,215.

This application Apr. 14, 1989, Ser. No. 338,713

Claims priority, application Japan, Oct. 15, 1986, 61-244995; Oct. 24, 1986, 61-163468

Int. Cl.[5] G06K *19/16, 19/18*

U.S. Cl. 235—488 **11 Claims**



1. A method of producing an optical recording card having a hologram contained therein, the card comprising a transpar-

ent front substrate of which an inside surface includes a hologram portion building area and an optical recording portion building area, said hologram portion building area being formed with a pattern of concavity and convexity in the form of interference fringe of hologram, a reflective metallic film covering said pattern of concavity and convexity, an optical recording pattern layer comprising a metallic film for covering said optical recording portion building area, and wherein said optical recording card includes a rear substrate adapted to be adhered to said front substrate in the form of sandwiching a reflective metallic film and said optical recording pattern layer, the method comprising the steps of

die pressing said pattern of concavity and convexity in the form of an interference fringe in said hologram portion building area of said transparent front substrate,

forming a reflective metallic film over said hologram portion building area and said optical recording portion building area of said front substrate after completion of said step of die pressing,

patterning reflective metallic film on the optical recording portion building area of said front substrate in accordance with an optical recording pattern after completion of said step of forming the reflective film,

adhering said rear substrate to said inside surface of said front substrate in the form of sandwiching said reflective metallic film after completion of said step of patterning, and

die punching both said front and said rear substrates to a shape of said optical recording card after completion of said step of adhering.

5,010,244

METHOD TO DETECT RADIATION AND MEASURE ITS ANGLE OF INCIDENCE AND A DETECTOR ARRANGEMENT TO CARRY OUT THE METHOD

Kurt Nissborg, Skänninge, Sweden, assignor to Forsvarets Forskningsanstalt, Stockholm, Sweden

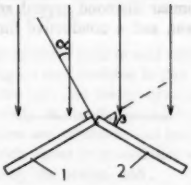
PCT No. PCT/SE88/00646, § 371 Date Jul. 20, 1989, § 102(e) Date Jul. 20, 1989, PCT Pub. No. WO89/04972, PCT Pub. Date Jun. 1, 1989

PCT Filed Nov. 25, 1988, Ser. No. 392,529

Claims priority, application Sweden, Nov. 27, 1987, 8704739

Int. Cl.[5] H01J *40/14*

U.S. Cl. 250—206.1 **8 Claims**



1. A method for detecting short pulses of speckled radiation caused by a turbulent atmosphere, and to measure its angle of incidence in relation to a reference direction comprising the steps of:

placing at least two detectors so they receive an irradiance that is essentially uncorrelated in the case of speckled radiation wherein the detectors are comprised of two detector elements, mounted so both detector elements receive essentially the same irradiance and in a direction that the normals of respective detector elements form a known angle with each other; and

calculating the angle of incidence using signals from the detector elements that depend on the shape of the sensitivity beams, and said angle between the detector elements.

5,010,245

RADIATION TRANSDUCING DEVICE WITH LOCATION IDENTIFICATION

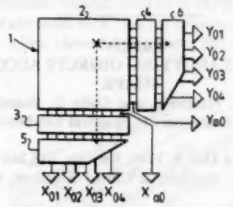
Bart M. H. L. Dierickx, Mortsel, Belgium, assignor to Interuniversitair Micro-Elektronica Centrum VZW, Belgium

Filed May 25, 1989, Ser. No. 356,800

Claims priority, application Netherlands, May 25, 1988, 8801342

Int. Cl.[5] H01J *40/14*

U.S. Cl. 250—208.1 **14 Claims**



1. A radiation transducing device for transducing radiation, comprising: an array of radiation sensitive elements, comparator elements connected to at least a portion of said array for comparing the amount of radiation received by the radiation sensitive elements to a predetermined threshold value, encoding element connected to said comparator elements for producing an output effective for identifying the location of said radiation sensitive elements which have been exposed to radiation and measuring means connected to said radiation sensitive elements for determining the amount of incident radiation collected in an element during a predetermined time period.

5,010,246

OPTICAL HEAD APPARATUS APPLICABLE TO OPTICAL DISC APPARATUS

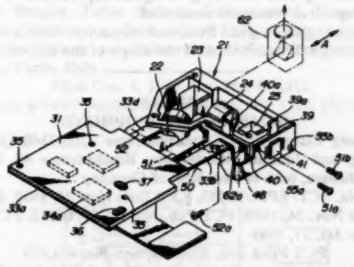
Hiroshi Tsuyuguchi; Yasushi Noda, both of Tokyo; Tsutomu Morita, Mitaka, and Kenji Shimozawa, Sagamihara, all of Japan, assignors to TEAC Corporation, Japan

Filed Jan. 16, 1990, Ser. No. 464,975

Claims priority, application Japan, Jan. 18, 1989, 1-3939[U]

Int. Cl.[5] H01J *3/14, 5/16;* G11B *7/00*

U.S. Cl. 250—216 **8 Claims**



1. An optical head apparatus applicable to an optical disc apparatus, comprising:

a case body having an open surface and a window through which an opto-electronics component can be positioned and housing optical components inside it;

a lid being attachable and detachable with respect to the open surface of said case body; and

a flexible printed circuit board having a base portion which is adhered to said lid and on which electronic components are mounted, and a protruding portion protruding from said base portion and having an opto-electronic component fixed to the distal end portion of it, said opto-elec-

tronic component being electrically connected with an electronic circuit which is formed by said electronic component on said base portion of said flexible printed circuit board, the distal end portion of said protruding portion of said flexible printed circuit board being fixed to said case body so that said opto-electronic component is positioned to said window,

whereby, when said electronic circuit and said opto-electronic component are maintained in a status of electrical contact said lid can be attached and detached with respect to said case body due to the bending of said protruding portion of said flexible printed circuit board.

5,010,247

METHOD OF CLASSIFYING OBJECTS ACCORDING TO SHAPE

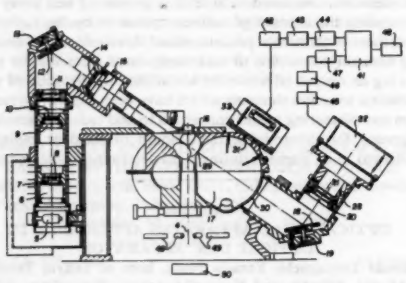
Martin P. Smith, Wargrave, and Colin D. Saunders, Marlow, both of England, assignors to Spandrel Establishment, Vaduz, Liechtenstein

Filed Oct. 6, 1989, Ser. No. 418,265

Claims priority, application United Kingdom, Oct. 7, 1988, 8823570

Int. Cl.[5] G01N *9/04*; B07C *5/04*

U.S. Cl. 250—223 R **9 Claims**



1. A method of making a rough classification of objects according to shape, comprising:

passing the objects in succession through a viewing zone;

in the viewing zone, viewing each object with at least three viewers which view along angularly spaced axes and thereby sensing respective areas presented to said viewers whereby said viewers give signals representative of said respective presented areas; and

comparing said signals from each respective viewer to make a rough determination of the shape of the object.

5,010,248

SAMPLING HYDROPHONE

Wolfgang Eisenmenger, Landhausstrasse 7, D-7140 Ludwigsburg, and Joachim Staudenraus, Bruehlstrasse 45, D-7303 Neuhausen, both of Fed. Rep. of Germany

PCT No. PCT/EP89/00053, § 371 Date Nov. 24, 1989, § 102(e) Date Nov. 24, 1989, PCT Pub. No. WO89/06512, PCT Pub. Date Jul. 27, 1989

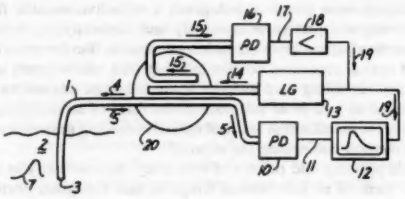
PCT Filed Jan. 17, 1989, Ser. No. 411,479

Claims priority, application Fed. Rep. of Germany, Jan. 25, 1988, 3802024

Int. Cl.[5] H01J *5/16*

U.S. Cl. 250—227.21 **12 Claims**

1. Hydrophone probe for measuring pressure amplitudes in a liquid medium (2) comprising, a light conductor in the form of an optical waveguide (1) having one end situated in the liquid medium; means connected on opposite end of the waveguide to be responsive to changes in the degree of reflection of light at the boundary 3 of said end and of liquid adjacent said end of the light conductor on account of pressure dependent changes in the relative index of refraction at said boundary and with reference to the liquid medium for being indicative of variable pressure amplitudes in said liquid medium, said means further including an optical reflection measuring device having a large



temporal resolution sufficient to respond to pressure variations beyond a megahertz range.

5,010,249

DIAMOND PROBE AND FORMING METHOD THEREOF

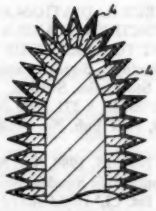
Akira Nishikawa, Tokyo, Japan, assignor to Seiko Instruments Inc., Japan

Filed Sep. 13, 1989, Ser. No. 406,458

Claims priority, application Japan, Sep. 13, 1988, 63-228991

Int. Cl.[5] H01J *37/26*

U.S. Cl. 250—306 **2 Claims**



2. A diamond probe comprising: a probe material having a pointed tip on which to form a carbon film comprised of a mixture of a columnar diamond crystal and an amorphous carbonic component, and a conductive film coated on said carbon film.

5,010,250

SYSTEM FOR SURFACE TEMPERATURE MEASUREMENT WITH PICOSECOND TIME RESOLUTION

Hani E. Elsayed-Ali, Rochester, N.Y., assignor to The University of Rochester, Rochester, N.Y.

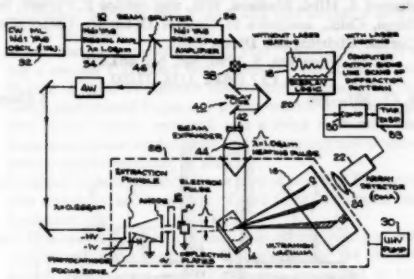
Filed Jan. 9, 1990, Ser. No. 462,376

Int. Cl.[5] H01J *37/295*

U.S. Cl. 250—310 **13 Claims**

1. A system for measuring the thermal characteristic of the surface lattice of solid state material which comprises means for generating successive pairs or groups of pairs of electron pulses and laser pulses which are synchronous with each other and are separated by successively greater periods of time, which pulses are incident on said surface of said material,

means for detecting diffraction patterns produced by said electron pulses upon reflection from said surface, and means



responsive to said patterns for obtaining said thermal characteristic.

5,010,251

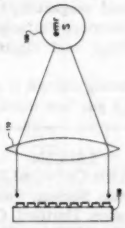
RADIATION DETECTOR ARRAY USING RADIATION SENSITIVE BRIDGES

Jan Grinberg, Los Angeles; Murray S. Welkowsky, Chatsworth; Chiung-Sheng Wu, Los Angeles, and Paul O. Braatz, Canoga Park, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Division of Ser. No. 370,109, Jun. 21, 1989, Pat. No. 4,922,116, which is a continuation-in-part of Ser. No. 228,630, Aug. 4, 1988, abandoned. This application Jan. 11, 1990, Ser. No. 463,563

Int. Cl.[5] H01L *31/09*

U.S. Cl. 250—332 **46 Claims**



1. A two-dimensional sensing array for electromagnetic radiation (emr), comprising:

a substrate,

an array of emr detector cells in said substrate, each of said cells including an emr sensitive bridge structure spanning a portion of the cell, said bridge structure being shaped to form a generally thermally insulative gap between the bridge structure and substrate, and having a defined characteristic which varies in accordance with the amount of emr received by the bridge, and

means for monitoring said defined characteristic for each of said cells.

5,010,252

IONIZATION DETECTOR

Douglas S. Steele, Saratoga Springs, N.Y., assignor to General Electric Company, Cincinnati, Ohio

Division of Ser. No. 565,670, Dec. 27, 1983, Pat. No. 4,613,313. This application Jun. 10, 1986, Ser. No. 872,588

The portion of the term of this patent subsequent to Sep. 23, 2003, has been disclaimed.

Int. Cl.[5] G01T *1/185*

U.S. Cl. 250—385.1 **16 Claims**

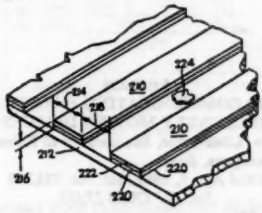
1. An ionization detector, comprising:

(a) a chamber containing xenon gas at a pressure exceeding 800 pounds per square inch;

(b) collimation means for collimating incoming radiation;

(c) window means for admitting collimated radiation into the chamber and for preventing escape of xenon from the chamber;

(d) an array of substantially parallel, elongated detector elements supported by a substrate and extending into the chamber and having a cross-sectional configuration inside the chamber which is substantially identical to the cross-sectional configuration outside the chamber, the array having metallic residue located in the spaces between the detector elements such that the cross-sectional area of the residue, when viewed from above the array, is less than



0.50% of the area of the spacing between the detector elements, the array having been manufactured by a process which includes the following steps:

(i) depositing an array of detector elements upon the substrate in a configuration which is substantially identical to the configuration of (d), each detector element comprising a nickel-containing layer adjacent the substrate and gold-containing layer atop the nickel-containing layer;

(ii) removing the gold-containing layer so as to provide an array of detector elements comprised of the nickel-containing layer; and

(iii) removing metallic residue located in the spaces between the detector elements so that said residue has said cross-sectional area.

5,010,253

DETECTION SYSTEM FOR CATHODOLUMINESCENCE ANALYSIS

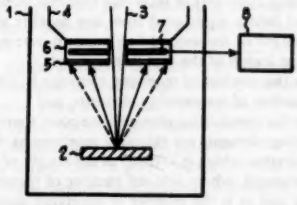
Marco Braglia, Turin; Roberto DeFranceschi, Vinovo, and Paolo Montangero, Turin, all of Italy, assignors to SIP - Societa Italiana per L-Esercizio Delle Telecomunicazioni P.A., Turin, Italy

Filed Dec. 4, 1989, Ser. No. 445,412

Claims priority, application Italy, Dec. 16, 1988, 68115 A/88

Int. Cl.[5] H01J *37/09*

U.S. Cl. 250—399 **7 Claims**



1. A detection system for material analysis by cathodoluminescence, comprising:

means for directing a beam of electrons onto a sample of a material to be analyzed whereby said sample generated photons characteristic of said material;

a detector positioned proximal to said sample for receiving photons generated by said sample; and

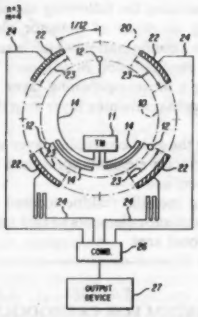
a photon-passing electron-blocking screen disposed between said sample and said detector to intercept electrons from said sample and prevent impingement of electrons from said sample on said detector, said screen being constituted of a plate of a glass selected from the group which consists of fluoride glasses, chalcogenide glasses and Ag-based glasses.

5,010,254

SYSTEM FOR COMMUNICATING ENERGY BETWEEN RELATIVELY MOVING DEVICES

John F. Moore, Libertyville, Ill., assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Apr. 5, 1989, Ser. No. 333,249
Int. Cl.[5] G02B 27/00
U.S. Cl. 250—551 **18 Claims**



1. A system for communicating energy from a first device to a second device, where the first and second devices are capable of movement relative to one other and include corresponding first and second parallel line segments which pass by one another upon the relative movement of the devices, comprising:

means for transmitting energy, including a plurality of transmitting elements mounted on the first device equidistant from one another along a first length of the first line segment; and

means for receiving energy from the transmitting means, including a plurality of receiving elements mounted on the second device equidistant from one another along a second length of the second line segment corresponding to the first length of the first line segment;

wherein the number of receiving elements is different than the number of transmitting elements, and

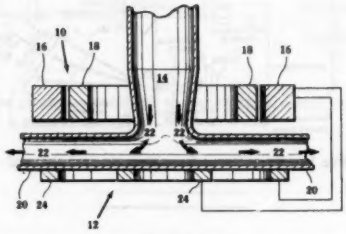
wherein the transmitting elements are point sources, and the receiving elements are extended receivers having a range of operation which is 1/(n-m) of the length of the second line segment, where n is the number of transmitting elements and m is the number of receiving elements, such that the range of operation between a transmitting element and a receiving element is sufficient to assure an operative relationship between at least one of the transmitting elements and one of the receiving elements upon the relative movement of the devices.

5,010,255

HIGH CURRENT MAGNETOHYDRODYNAMIC GIGAWATT PULSE GENERATOR

Mohamed A. Hilal, Madison, Wis., and Jerome F. Parmer, San Diego, Calif., assignors to General Dynamics Corporation, Convair Division, San Diego, Calif.

Filed Jan. 5, 1990, Ser. No. 461,510
Int. Cl.[5] H03K 3/38, 31/00
U.S. Cl. 307—106 **4 Claims**



1. A high current MHD gigawatt pulse generator comprising:

a pulse power transformer having a superconducting primary winding and a normal secondary winding;

a gas high temperature channel extending through said pulse power transformer adjacent to said primary winding and beyond;

a magnetohydrodynamic disk generator having electrical current pickups positioned opposite said pulse power transformer attached to said channel whereby gas in said channel flows through magnetic flux created by said primary winding of said pulse power transformer and across said pickups of said magnetohydrodynamic generator, said pickups are electrically attached to said primary for storing current from said electrical current pickups therein;

means for initially storing current in said primary; and

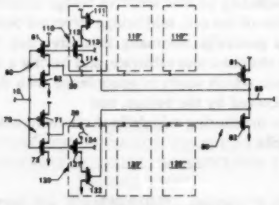
means for supplying a gas flow through said channel.

5,010,256

GATE OUTPUT DRIVER USING SLEW-RATE CONTROL

Curtis J. Dicke, Colorado Springs, Colo., assignor to United Technologies Corporation, Hartford, Conn.

Filed Feb. 21, 1989, Ser. No. 313,193
Int. Cl.[5] H03K 5/08, 5/12, 6/04
U.S. Cl. 307—263 **6 Claims**



1. A circuit for controlling the output of an integrated circuit to limit the rate of change of output current comprising:

an output inverter having a P-channel output transistor having a P-gate and being connected between a positive power supply terminal and an output node and an N-channel output transistor having an N-gate and being connected between said output node and a negative power supply terminal;

a first bias circuit connected to said P-gate and comprising a first P-channel bias transistor connected to said positive

power supply terminal, a first N-channel bias transistor that is connected between said P-channel bias transistor and said first P-gate and a second N-channel bias transistor connected between said P-gate and said negative power supply terminal;

a second bias circuit connected to said N-gate and comprising a second P-channel bias transistor connected to said N-gate, a third N-channel bias transistor connected between said second P-channel bias transistor and said negative power supply terminal, and a third P-channel bias transistor connected between said N-gate and said positive power supply terminal, in which;

said output node is connected to a gate of said first P-channel bias transistor and to a gate of said third N-channel bias transistor; and

said first and second N-channel bias transistors, and said second and third P-channel bias transistors are all controlled by an input node that is also connected to said P-gate and said N-gate.

5,010,257

BICMOS LOGIC CIRCUIT WITH FULL SWING OPERATION

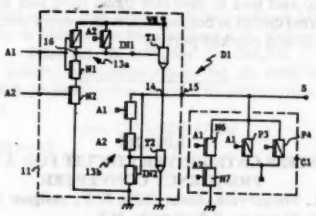
Gerard Boudon, Mennecy; Pierre Mollier, Boissise Le Roi; Jean-Paul Nuez, Savigny Sur Orge; Ieng Ong, Antony; Pascal Tannhof, Perthes, and Franck Wallart, Cesson, all of France, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 13, 1990, Ser. No. 493,014

Claims priority, application European Pat. Off., Mar. 14, 1989, 89480044.0

Int. Cl.[5] H03K *19/02, 19/094, 3/01*

U.S. Cl. 307—446 **13 Claims**



1. A BICMOS logic circuit biased between first and second supply voltages, comprising:

a CMOS logic circuit driven by a plurality of logic input signals;

a driving circuit connected to said CMOS logic circuit and including first and second bipolar transistors connected in series with an output node therebetween for providing an output signal on said output node; and

interface circuit means comprised of at least one pair of CMOS transistors connected to said first and second supply voltages for forcing said output signal to swing fully between said first and second supply voltages responsive to said logic input signals.

5,010,258

PROGRAMABLE LOGIC ARRAY USING ONE CONTROL CLOCK SIGNAL

Kimiyoshi Usami, Yokohama, and Aya Ishii, Tokyo, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 12, 1989, Ser. No. 406,099

Int. Cl.[5] H03R *19/096*

U.S. Cl. 307—469 **8 Claims**

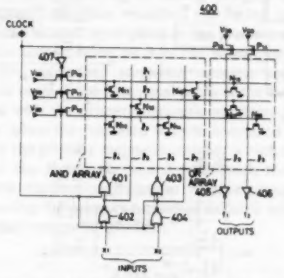
1. A programable logic array, comprising:

an AND array and an OR array respectively composed of a plurality of second conductivity type MOS transistors;

a plurality of first conductivity type MOS transistors of a first group each having one terminal connected to an electrical power source for supplying a predetermined voltage; and

a plurality of first conductivity type MOS transistors of a second group each having one terminal connected to said electrical power source,

wherein a true single clock signal is supplied to gate terminals of said first conductivity type MOS transistors of said second group;



a complementary clock signal of said true single clock signal is supplied to gate terminals of said first conductivity type MOS transistors of said first group; and

wherein a ratio of gate width W and gate length L, i.e., W/L, of each of said first conductivity type MOS transistors of said second group is smaller than that of said first conductivity type MOS transistors of said first group.

5,010,259

VOLTAGE BOOSTING CIRCUIT AND OPERATING METHOD THEREOF

Yoshinori Inoue; Masaki Kumanoya; Takahiro Komatsu; Yasuhiro Konishi, and Katsumi Dosaka, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 21, 1989, Ser. No. 454,580

Claims priority, application Japan, Dec. 28, 1988, 63-332238

Int. Cl.[5] H03K *4/58, 19/017, 17/04, 19/094*

U.S. Cl. 307—482 **12 Claims**

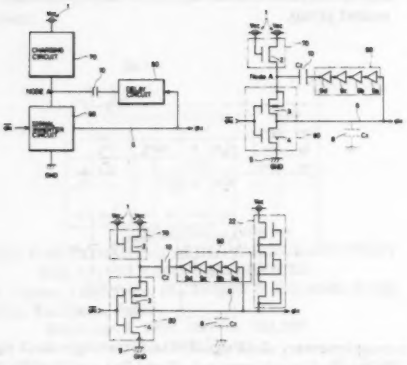
1. A voltage boosting circuit provided in a semiconductor integrated circuit device for generating at an output terminal an output signal boosted to be higher than a supply voltage, comprising:

charging means provided between a power supply and a prescribed node in said voltage boosting circuit for being conductive when the potential of said node is lower than a given value, thereby charging said prescribed node, and being nonconductive when the potential of said prescribed node is higher than a given value, thereby preventing charge from flowing back to the power supply from said prescribed node,

signal inverting means responsive to an input signal for providing said output signal inverted from said input signal to an output terminal thereof based on the potential of said prescribed node and a ground potential,

delay means coupled between said output terminal and said

prescribed node for delaying said output signal by a given time, and



capacitor means responsive to the output of said delay means for boosting the potential of said prescribed node and consequently boosting said output signal.

5,010,260

INTEGRATED CIRCUIT FURNISHING A SEGMENTED INPUT CIRCUIT

Roger D. Norwood, Sugarland, and David V. Kersh, III, Houston, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 455,870, Dec. 19, 1989, abandoned, which is a continuation of Ser. No. 265,069, Oct. 31, 1988, abandoned. This application Jun. 11, 1990, Ser. No. 537,207

Int. Cl.[5] H03K *17/08, 17/16, 19/003, 19/092*

U.S. Cl. 307—482.1 **16 Claims**

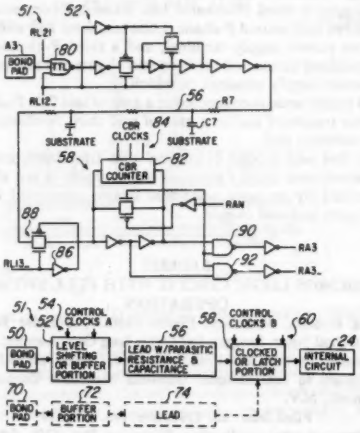
1. An integrated circuit furnishing a segmented input circuit, comprising:

A. a substrate of semiconductor material;

B. plural bonding pads carried upon said substrate at the margin of said substrate, at least some of said bonding pads receiving signals from external of said substrated;

C. an internal circuit formed on said substrate and receiving at least one of said signals received at one of said bonding pads, said one bonding pad being spaced from said internal circuit a distance that otherwise includes sufficient parasitic capacitance and resistance to distort said at least one signal; and

D. an input circuit formed on said substrate and connecting said one bonding pad to said internal circuit to carry said at least one signal from said bonding pad to said internal circuit, said input circuit including a level shifing portion located adjacent said bonding pad that changes said signal from external of said substrate to voltage levels used in



said internal circuit, a lead subject to parasitic resistance and capacitance extending from said level shifting portion and carrying said level shifted signal, and a clocked portion located adjacent said internal circuit and connected to said lead to pass said signal from said lead to said internal circuit in conjunction with control clocks extending to said clocked portion.

5,010,261

LOSSLESS GATE DRIVER CIRCUIT FOR A HIGH FREQUENCY CONVERTER

Robert L. Steigerwald, Barnt Hills, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 8, 1989, Ser. No. 447,947

Int. Cl.[5] H03K *17/687, 19/017*

U.S. Cl. 307—571 **15 Claims**

1. An efficient gate driver circuit for driving a semiconductor power switching device of a high-frequency power converter, said power switching device having an input capacitance, comprising:

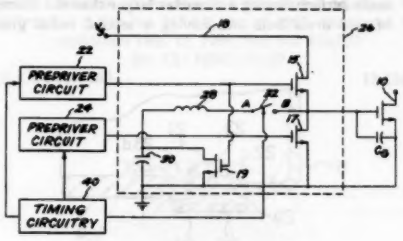
first and second switch means for coupling to a gate drive power supply and connected in series in a half-bridge configuration with a junction therebetween, the gate of said power switching device being coupled to said junction;

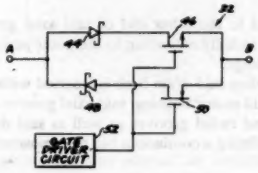
ac switch means having two terminals, one of said terminals being coupled to said first and second switch means at said junction therebetween;

resonant circuit means coupled to the other one of said terminals of said ac switch means for resonantly charging and discharging said input capacitance so as to result in substantially lossless gate driver switching, said ac switch means being operable to couple said series resonant circuit to said power switching device during the resonant charging and discharging of said input capacitance;

said first switch means ensuring that said input capacitance is fully charged and said power switching device remains on before said ac switch means is activated in order to discharge said input capacitance; and

said second switch means ensuring that said input capacitance is fully discharged and said power switching device





remains off before said ac switch means is activated in order to charge said input capacitance.

5,010,262

STRONG MAGNETIC THRUST FORCE TYPE ACTUATOR

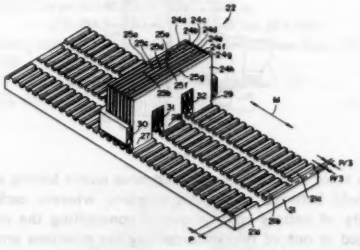
Hiroshi Nakagawa, and Minoru Maeda, both of Mie, Japan, assignors to Shinko Electric Company Ltd., Tokyo, Japan

Filed Jul. 18, 1989, Ser. No. 381,351

Claims priority, application Japan, Jul. 20, 1988, 63-180497; Nov. 8, 1988, 63-282021; Nov. 8, 1988, 63-282022; Nov. 14, 1988, 63-287033

Int. Cl.[5] H02K *41/00*

U.S. Cl. 310—12 **17 Claims**



1. A strong magnetic thrust force type actuator comprising:

a primary magnetic member supported by a support means moving along a predetermined direction, the primary magnetic member generating a magnetic field in a direction transverse to the predetermined direction through magnetic poles thereof; and

a secondary magnetic member having a plurality of facing portions facing the primary magnetic member, in which the facing portions are disposed at an equal pitch in the predetermined direction, thus moving the primary magnetic member relative to the secondary magnetic member when a magnetic field acts upon the facing portions formed with the secondary magnetic member, the improvement wherein

the primary magnetic member comprises:

a core having a plurality of plate members separated by first equal pitches in the predetermined direction, in which the plate members have facing portions which extend in a direction transverse to the predetermined direction;

a plurality of permanent magnet, inserted between side surfaces of the plate members in a direction perpendicular to the facing portions so that adjacent permanent magnets are of an opposite polarity; and

an insulated wire wound around the cores so as to form magnetic poles, wherein

the secondary magnetic member comprises:

the facing portions facing the facing portions formed with the primary magnetic member, the facing portions disposed at a second equal pitch in the predetermined direction, the second equal pitch of the facing portion formed with the secondary magnetic member approximately twice as large as the first equal pitch of the facing portion formed with the primary magnetic member,

whereby when the insulated wire is energized facing portions of the primary magnetic member which are disposed toward the facing portions formed with the secondary magnetic member contribute to produce a magnetic thrust for moving the primary magnetic member relative to the secondary magnetic member.

5,010,263

HALL EFFECT TYPE SENSING DEVICE

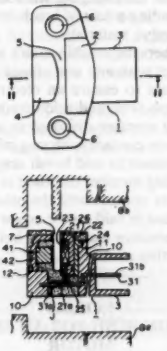
Shigemi Murata, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 14, 1990, Ser. No. 479,921

Claims priority, application Japan, Feb. 21, 1989, 1-39455; Feb. 23, 1989, 1-41884

Int. Cl.[5] F01B *7/14*

U.S. Cl. 310—68 B **3 Claims**



1. A Hall effect type sensing device, comprising:

magnetic circuit forming means including a permanent magnet;

a Hall transducing element arranged in a magnetic circuit formed by the magnetic circuit forming means;

a frame body having a holding part for locating and holding the magnetic circuit forming means and the Hall transducing element in predetermined positions, the frame body being prepared by primary molding; and

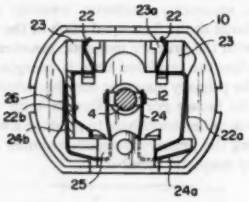
a protective compound encapsulating the magnetic circuit forming means, the permanent magnet, and the Hall transducing element together with the frame body to prevent any relative movement therebetween, the protective compound being prepared by secondary molding and defining a gap in the magnetic circuit forming means, a movable shutter, and said gap adapted to accommodate said movable shutter.

5,010,264

MINIATURE MOTOR HAVING POSITIVE-COEFFICIENT THERMISTOR

Shinjiro Yamada; Seiki Satoh, both of Utsunomiya; Kazuichi Mabuchi, Matsudo; Shiei Kitao, Matsudo, and Yoshiaki Egawa, Matsudo, all of Japan, assignors to Mabuchi Motor Co., Ltd., Chiba and Mitsui Mining & Smelting Co., Tokyo, both of, Japan

Filed Sep. 1, 1989, Ser. No. 402,499
Claims priority, application Japan, Sep. 9, 1988, 63-118363[U]; Dec. 14, 1988, 63-162101[U]
Int. Cl.[5] H02K *11/00*; H01C *7/02*; H02H *5/04*
U.S. Cl. 310—72 9 Claims



1. A miniature motor having a positive-coefficient thermistor comprising a stator having a permanent magnet as a field, a rotor formed by winding a plurality of rotor windings on a rotor core; current being fed to said rotor windings via a commutator making sliding contact with brushes supported by a motor cover plate, making contact with a commutator; and a positive co-efficient thermistor for controlling current to said rotor windings, in which said motor cover plate has a pair of terminal holders for holding terminals;

said terminals including a pair of terminals made of an electrically conductive material and having engaging and locking portions for engaging with said terminal holders;

said brushes including a pair of brush arms made of an electrically conductive material;

connecting members disposed in such a manner as to come in resilient contact with any one of said brush arms and one of said terminals to ensure an electrical connection between said brush arms and said terminals;

a first supporting member disposed in such a manner as to come in resilient contact with one of said brush arms to electrically connect to said brush arms; and ,

a second supporting member disposed in such a manner as to come in resilient contact with the other one of said terminals are provided in said motor cover plate; said positive-coefficient thermistor being held between said first and second supporting members.

5,010,265

MOISTURE DRAIN BUSH FOR AN ENGINE STARTER MOTOR

Takao Tanaka, and Kazuhiro Odahara, both of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

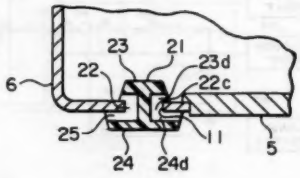
Filed Feb. 9, 1990, Ser. No. 477,376
Claims priority, application Japan, Feb. 10, 1989, 1-32123
Int. Cl.[5] H02K *5/10*
U.S. Cl. 310—88 5 Claims

1. A moisture drain bush adapted to be inserted into and held by a moisture drain hole defined in a housing wall of an engine starter motor, comprising:

a stem having a first and a second end, said stem having an axial length substantially equal to a thickness of said housing wall and having an axial groove extending between said first and second ends of said stem;

a first flange having a substantially flat inner surface radially extending from said first end of said stem, said inner surface having a diameter larger than the diameter of said drain hole and having a first radial groove connected to one end of said axial groove in said stem and radially extending to the outer periphery of said first flange; and

a second flange having a substantially flat inner surface radially extending from said second end of said stem, said inner surface having a diameter larger than the diameter of said drain hole and having a second radial groove



connected to the other end of said axial groove in said stem and radially extending to the outer periphery of said second flange;

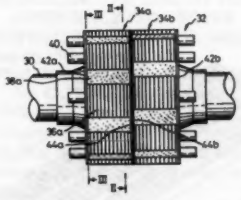
whereby, when said drain bush is inserted within said drain hole in said motor housing, said axial groove and said first and second radial grooves as well as said drain hole together defining a continuous but bent moisture drain path.

5,010,266

ANTI-CLOGGING OFFSET FOR ROTOR OF SYNCHRONOUS MOTOR

Hiroyuki Uchida, Yamanashi, Japan, assignor to Fanuc LTD, Yamanashi, Japan

PCT No. PCT/JP88/00879, § 371 Date Apr. 25, 1989, § 102(e) Date Apr. 25, 1989, PCT Pub. No. WO89/02183, PCT Pub. Date Mar. 9, 1989
PCT Filed Sep. 2, 1988, Ser. No. 368,400
Claims priority, application Japan, Sep. 3, 1987, 62-219242
Int. Cl.[5] H02K *21/14*
U.S. Cl. 310—156 5 Claims



1. A rotor structure of a synchronous motor having a rotor core held between permanent magnets, wherein each of a plurality of unitary rotor elements constituting the rotor is arranged at one of two different angular positions around a central axis of said rotor which positions correspond with a period of slot ripple of the motor, such that an angular difference between said two angular positions is an angle corresponding to a half wave of the slot ripple, wherein axial end portions of permanent magnet elements and rotor core elements which together constitute the unitary rotor element in each angular position provide axial recesses and projections, and wherein each unitary rotor element of said rotor is provided with end plate members arranged at both ends of said rotor and between said unitary rotor elements, said end plate members being formed with axial projections and recesses engaged, respectively, with said axial recesses and projections formed by said permanent magnet elements and said rotor core elements such that said end plate members hold each unitary rotor element precisely at a prescribed angular position.

5,010,267

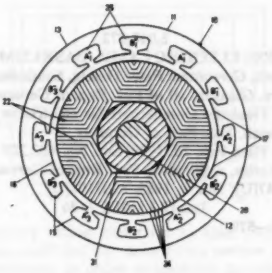
VARIABLE SPEED MACHINE WITH HIGH POWER DENSITY

Thomas A. Lipo, and Longya Xu, both of Madison, Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Continuation of Ser. No. 243,073, Sep. 9, 1988, abandoned. This application Dec. 22, 1989, Ser. No. 456,032

Int. Cl.[5] H02K *19/02*

U.S. Cl. 310—162 15 Claims



1. A reluctance machine adapted for variable speed drive, comprising:

(a) a stator including a core, and windings supported thereon formed of multiple coils, the windings having full pitch, plural poles and plural phases;

(b) a rotor having multiple pole segments which each include means for guiding the flux of the stator windings to provide maximum inductance for a stator coil of each pole and phase which is conducting current when the rotor segment is aligned with that coil and minimum inductance when the rotor segment is out of alignment with that coil and aligned with the adjacent coil of the stator, with the number of rotor segments distributed about the periphery of the rotor equal to the number of stator poles.

5,010,268

ELECTRICAL MULTI-POLE MACHINE

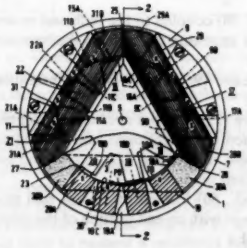
Reinder H. Dijken, Groningen, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 31, 1989, Ser. No. 359,468

Claims priority, application Netherlands, Jun. 27, 1988, 8801628

Int. Cl.[5] H02K *1/12, 21/26, 1/00*

U.S. Cl. 310—254 4 Claims



1. An electrical multi-pole machine of the electromagnetic type, the machine comprising:

a first machine section which comprises a soft-magnetic first body provided with permanent magnets having pole faces disposed along a first circularly cylindrical surface, said pole faces extending both axially and tangentially,

a second machine section which is coaxial with the first machine section and which comprises a second body provided with soft-magnetic teeth having regularly spaced tooth surfaces which are disposed along a second circularly cylindrical surface and which cooperate with the pole faces via an air gap, said tooth surfaces also extending both axially and tangentially,

at least three active coils each having two opposite coil sides, and

a machine shaft about which said machine sections are rotatable relative to each other, characterized in that

the soft-magnetic first body is a cylindrical outer body on whose inner side the radially magnetized magnets are arranged,

the first machine section is constructed as the stator and the second machine section is constructed as the rotor, and the pole faces, viewed in the circumferential direction of said first cylindrical surface, are arranged in groups, at least three groups of magnets being distinguished, the number of groups of magnets being equal to the number of active coils, which groups are separated from one another by coils slots in which the coil sides of the active coils are accommodated, adjacent pole faces along said first circularly cylindrical surface in each of said groups having opposite polarities,

a tangential dimension of the axially and tangentially extending tooth surfaces is smaller than or equal to a corresponding tangential dimension of the pole faces, and

two of said coil sides of the active coils are accommodated in each of the coil slots which extend at least substantially parallel to the machine shaft, said coil sides of each individual active coil each being accommodated in one of the coil slots at opposite sides of one of the groups of magnets and being interconnected by coil end portions.

5,010,269

SAW RESONATOR HAVING A BROAD BANDWIDTH

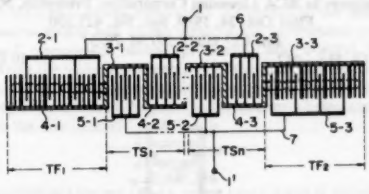
Mitsutaka Hikita, Hachioji; Atsushi Sumioka, Kokubunji; Toyoji Tabuchi, Kodaira; Kazuhito Kurosawa, Katsuta, and Tuneo Kinoshita, Kokubunji, all of Japan, assignors to Hitachi, Ltd.; Hitachi Denshi Kabushiki Kaisha, both of Tokyo and Hitachi Communication System, Inc., Yokohama, all of, Japan

Filed Dec. 9, 1988, Ser. No. 282,177

Claims priority, application Japan, Dec. 14, 1987, 62-314136

Int. Cl.[5] H01L *41/08*

U.S. Cl. 310—313 B 13 Claims



1. A SAW resonator comprising:

a piezoelectric substrate;

a plurality of resonating SAW transducer units formed on said substrate and juxtaposed in a direction of propagation of acoustic waves on said substrate, each of said resonating SAW transducer units including at least one first SAW transducer and at least one second SAW transducer electrically connected with each other and juxtaposed in said acoustic wave propagation direction on said substrate; and

first and second unidirectionally reflecting SAW transducer units formed on said substrate and arranged to be juxtaposed in said acoustic wave propagation direction with respect to said plurality of juxtaposed resonating SAW transducer units on first and second ends thereof, respectively.

5,010,270

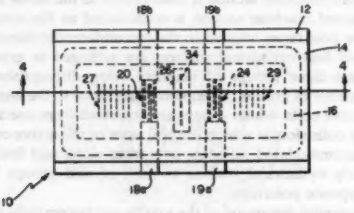
SAW DEVICE

James A. Greer, Andover, Mass., assignor to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 293,607, Jan. 5, 1989, abandoned, which is a continuation of Ser. No. 153,186, Mar. 8, 1988, abandoned, which is a continuation of Ser. No. 944,911, Dec. 22, 1986, abandoned. This application Nov. 28, 1989, Ser. No. 442,404

Int. Cl.[5] H01L *41/08*

U.S. Cl. 310—313 D 29 Claims



1. A surface acoustic wave device comprising:

a base having a surface for supporting surface wave propagation, including at least a transducer coupled to said surface wave propagation surface;

a cover disposed over said base enclosing said surface wave propagating surface, said cover comprised of a material which is optically transparent to electromagnetic energy generally in the wavelength range of about 0.185 μm to 4 μm;

a first layer comprised of a metal oxide and disposed between said cover and base; and

a second layer comprised of a metal oxide and disposed on said surface wave propagation surface with a first one of said first and second layers having a recess and with a second, different one of said first and second layers disposed in alignment with said recess and having dimensions comparable to those of said recess.

5,010,271

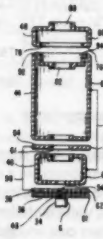
COLOR PICTURE TUBE HAVING AN ELECTRON GUN WITH REDUCED CONVERGENCE DRIFT

Loren L. Maninger, and Bruce G. Marks, both of Lancaster, Pa., assignors to RCA Licensing Corporation, Princeton, N.J.

Filed Oct. 24, 1989, Ser. No. 427,230

Int. Cl.[5] H01J *29/50, 29/51*

U.S. Cl. 313—412 10 Claims



1. In a color picture tube including a screen and an inline electron gun for generating and directing three inline electron beams along separate paths toward said screen, said electron gun comprising a plurality of cathodes and at least six electrodes longitudinally spaced from said cathodes, the improvement comprising

the first, second and fourth electrodes from said cathodes being of materials having lower coefficients of thermal expansion than the coefficients of thermal expansion of the materials of the other electrodes.

5,010,272

CEMENTLESS ELECTRIC LAMP - BASE COMBINATION

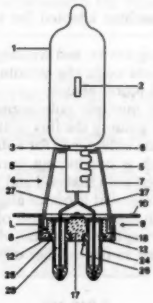
Fritz Eckhardt, Gerstetten; Peter Helbig, Sontheim, and Walter Schoenherr, Giengen, all of Fed. Rep. of Germany, assignors to Patent Treuhand Gesellschaft für elektrische Gluhlampen mbH, Munich, Fed. Rep. of Germany

Filed Feb. 20, 1990, Ser. No. 482,289

Claims priority, application Fed. Rep. of Germany, Feb. 24, 1989, 8902247[U]; Jun. 9, 1989, 8907108[U]

Int. Cl.[5] H01K *1/46*

U.S. Cl. 313—579 21 Claims



1. A cementless electric lamp (1, 31) and base combination in which the lamp comprises a single-ended bulb (1, 31) having a press seal (3, 33) at one end thereof, filaments (2, 32) located within the bulb, and current connection leads (27, 51) extending outwardly of the press seal; and

the base comprises

a metallic base sleeve (9, 40), a base core (17, 48) of insulating material, and terminal contact elements (24, 24', 56) electrically connected to said current connection leads (27, 51), and

means (4, 7, 38) coupled to the bulb and secured to the base sleeve for attaching the bulb to the base sleeve,

wherein

the base sleeve (9, 40) is a hollow essentially cylindrical structure;

the base core (17, 48) is an apertured, essentially cylindrical solid structure dimensioned and shaped to fit into said hollow base sleeve, and defining an end surface (16', 47) remote from the lamp;

a rim (12, 15', 50) formed on one of said structures and in engagement with an end portion of the other of said structures; and

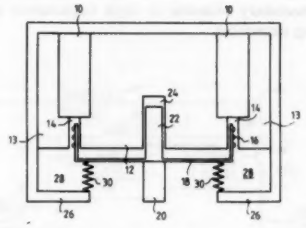
projecting tabs (13, 13', 45) formed on said sleeve and bent by about 90° and extending at least in part transversely to the longitudinal axis (CL) of the lamp and over part of the end surface (16', 47); and

wherein said rim and said projecting tabs are, respectively, positioned to lock the base core into the base sleeve and hence lock the base core and the base sleeve together without play.

5,010,273
AGILE MAGNETRON WITH TUNING MOTOR WITH IMPROVED COOLING

Alain Vermersch, Velizy, France, assignor to Thomson-CSF, Puteaux, France

Filed Jul. 7, 1989, Ser. No. 377,092
Claims priority, application France, Jul. 8, 1988, 88 09308
Int. Cl.[5] H01J 25/50
U.S. Cl. 315—39.61 6 Claims

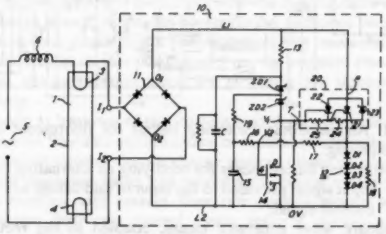


1. A frequency tuning motor for an agile magnetron, said motor having a coil that moves in a very narrow gap facing a pole piece wherein, in order to improve the cooling of the motor, the space between the coil and the pole piece is filled with a gas having high thermal conductivity.

5,010,274
STARTER CIRCUITS FOR DISCHARGE LAMPS

Geoffrey J. Phillips, Gilesgate, and Kevin F. George, Merstham, both of England, assignors to Thorn EMI plc, London, England

Filed Mar. 16, 1989, Ser. No. 324,510
Claims priority, application United Kingdom, Mar. 17, 1988, 8806384
Int. Cl.[5] H05B 41/36
U.S. Cl. 315—101 12 Claims

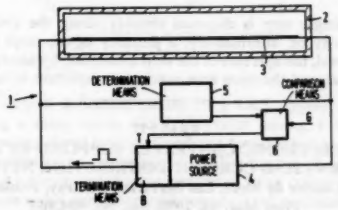


1. A starter circuit suitable for a discharge lamp which is connected to an alternating voltage supply by means of a reactive ballast, the starter circuit comprising a rectifier for connecting the lamp to first and second voltage supply lines; at least one diode; a current control circuit having a controlled current path connected in series with said at least one diode between the voltage supply lines, the current control circuit being arranged to control flow of current in said controlled current path in dependence on a first control voltage applied at a control terminal of the current control circuit, whereby, in operation, the controlled current path can be triggered into a non-conducting state to present a relatively high impedance, preventing a flow of current in said path, and can be triggered into a conducting state to present a relatively low impedance, allowing a flow of current in said path; means for deriving from the rectified supply a predetermined said control voltage to trigger said current control circuit into said conducting state and a field effect transistor arranged to modify said predetermined control voltage in dependence on a further control voltage applied to the gate electrode of said field effect transistor, to trigger said current control circuit into said non-conducting state and cause a high voltage striking pulse to be applied across the lamp, said further control voltage being dependent on a voltage at a junction between said at least one diode and said controlled current path, whereby the starting circuit, in operation, triggers said controlled current path into its conducting an non-conducting state a plurality of times during a half cycle of applied alternating voltage to provide a succession of said high voltage striking pulses across said discharge lamp during a single half cycle of the rectified supply thereby assisting the starting of said lamp.

5,010,275
ELECTRON TUBE DEVICE AND ELECTRON TUBE

Ronald van der Wilk, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 13, 1989, Ser. No. 337,241
Claims priority, application Netherlands, Apr. 20, 1988, 8801016
Int. Cl.[5] H05B 41/36
U.S. Cl. 315—106 7 Claims



1. In an electron display tube apparatus including an envelope containing a line cathode and including an electric power source for repetitively supplying power pulses to the line cathode, the improvement comprising means for controlling the line cathode temperature, said means including:

a. termination means electrically connected to the power source and having an input for receiving a control signal, said termination means effecting termination of each of the power pulses when the control signal is applied to the input;

b. determination means coupled to the line cathode for directly determining the temperature of said cathode and for producing a value representative of said temperature;

c. comparison means electrically connected to the determination means and to the input of the termination means, said comparison means producing said control signal when the value representative of the line cathode temperature reaches a predetermined magnitude, thereby effecting termination of the pulse instantaneously being supplied to the line cathode.

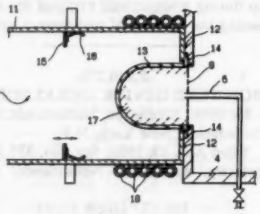
5,010,276
MICROWAVE PLASMA CVD APPARATUS WITH PLASMA GENERATING CHAMBER CONSTITUTING A CYLINDRICAL CAVITY RESONATOR

Hiroshi Echizen, Tokyo, and Satoshi Takaki, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 3, 1988, Ser. No. 252,646
Claims priority, application Japan, Oct. 9, 1987, 62-256030; Oct. 9, 1987, 62-256031
Int. Cl.[5] H01J 7/24
U.S. Cl. 315—111.21 8 Claims

1. In a microwave plasma CVD apparatus comprising a treating chamber having means for supporting a body to be treated therein, a plasma generating chamber connected to the treating chamber through a metal mesh, means for introducing a gas into the plasma generating chamber, and means for introducing microwave to convert the gas in the plasma generating

chamber into a plasma, the improvement comprising: (a) means for maintaining the microwaves in continuous oscillation, (b) the plasma generating chamber constituteing a cylindrical cavity resonator defined by the metal mesh and a stop or stops, and (c) a bell-jar (i) smaller than the cavity in the axial length and (ii) smaller than the inside diameter of said cavity being disposed in the cylindrical cavity resonator in contact with the



metal mesh, thereby constituting a reentrant cylindrical cavity resonator through generation of electric discharge in the bell-jar;

the single stop is disposed slidably along the cylindrical cavity or, alternatively, a plurality of the stops are disposed, the aperture of the stop is circular, 5-vane or polygonal, and the open area ratio of the aperture is variable.

5,010,277

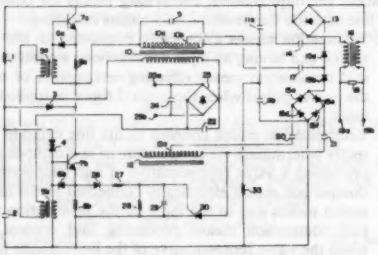
ELECTRONIC CONVERTER SUPPLIED BY AN ALTERNATING CURRENT DISTRIBUTION NETWORK

Henri Courier de Mere, Les Berruries, Mettray, France 37390

Filed Mar. 16, 1990, Ser. No. 494,980

Int. Cl.[5] H05B *37/02*

U.S. Cl. 315—200 R **13 Claims**



1. Electronic device for the conversion of energy supplied by a low frequency alternating mains voltage supply, rectified but not filtered, comprising a high frequency oscillator provided with switching means for which the conduction duty cycle is automatically maintained inversely proportional to the instantaneous value of the said rectified voltage, this oscillator being provided, at the output, with an oscillator circuit provided with a first inductor for matching the impedance of the load used to that of the said oscillator, characterized by the fact that a second inductor **12** derives a portion of the high frequency energy extracted by the said switching means so that, after rectification, the voltage thus obtained, suitably polarized, is added to the above mentioned rectified mains voltage, thus permitting an average resulting voltage to be obtained, which is at least equal to the peak voltage developed by the said mains supply, and additionally, another portion of the high frequency energy is extracted from the above mentioned oscillating circuit and after rectification, the voltage thus obtained suitably polarized is also applied in series with the rectified mains voltage, this, in order to perfect the low frequency demodulation of the rectified supply voltage of the said oscillator and to improve the linearity of the current taken from the mains supply in case of major variations in the nominal voltage of the mains supply, being such that, definitively, by means of the automatic control of the conduction cycle of the said switching means, the supply voltage of the said oscillator becomes continuous, without detrimentally affecting the sinusoidal nature of the mains supply current, this having as the final consequence the supply of the above mentioned load, having a stable or otherwise impedance, such as the series of discharge lamps **31***a* and **31***b* with a voltage for which the envelope is maintained continuous, without for as much, requiring necessary recourse to high capacitance electrolytic smoothing capacitors.

5,010,278

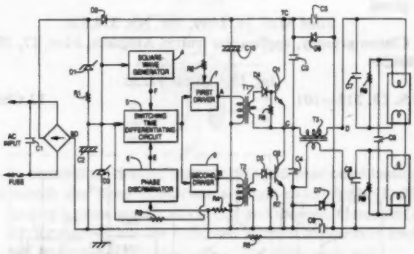
ELECTRONIC SWITCHING BALLAST FOR A FLUORESCENT LAMP

Sung H. Kang, Jinjoen-Meon, Rep. of Korea, assignor to Sung Ho Korea Company, Seoul, Rep. of Korea

Filed Jun. 14, 1989, Ser. No. 365,865

Int. Cl.[5] H05B *37/02*

U.S. Cl. 315—224 **4 Claims**



1. An electronic switching ballast for fluorescent lamps, comprising:

rectifying circuit means for rectifying an alternating current input signal provided to the input of said ballast to a direct current signal;

square wave generator means, coupled to the rectifying circuit means, for providing a square wave signal in response to said direct current signal;

phase discriminator means, coupled to the rectifying circuit means, for comparing a feedback signal with a reference voltage in response to said direct current signal to provide a full-wave rectified signal;

switching time differentiating circuit means, coupled to the square wave generator and phase discriminator means, for combining said square wave signal and said full-wave rectified signal, and for providing a pair of pulsed signals in reference to said combined signals, said pair of pulsed signals being out of phase with respect to one another; and

wave-shaping circuit means, coupled to the switching time differentiating circuit means, for providing a sinusoidal output signal in reference to said pair of pulsed signals to an external circuit, the output of said wave-shaping circuit means being coupled to the input of said phase discriminator means to feed back at least portion of said sinusoidal output signal to the phase discriminator means.

5,010,279

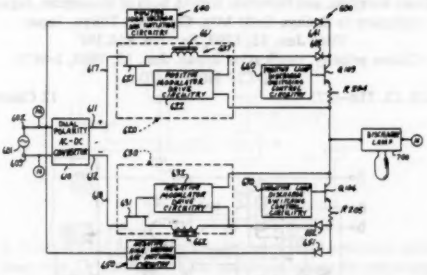
SWITCHED CAPACITIVE BALLASTS FOR DISCHARGE LAMPS

Michael S. Lathom, 4314 Forest Lakes Dr., Del Valle, Tex. 78617; Bruce B. Gullixson, 1513 W. Jackson, and Bruce P. Sweat, 3015 E. 16th, both of, Spokane, Wash. 99205

Continuation-in-part of Ser. No. 769,482, Aug. 26, 1985, Pat. No. 4,808,886. This application Mar. 11, 1988, Ser. No. 167,255

Int. Cl.[5] H05B *37/00, 39/00/41/14*

U.S. Cl. 315—227 R 103 Claims



1. A ballast circuit for controlling electrical current flow through an electrical discharge lamp from an electricity source providing alternating electrical current having positive potential portions and negative potential portions, comprising:

positive electrical charge storage means connected to receive current from said electricity source during said positive potential portions;

negative electrical charge storage means connected to receive current from said electricity source during said negative potential portions;

at least one positive current modulator for controllably modulating current discharged from the positive electrical charge storage means for powering the discharge lamp;

at least one negative current modulator for controllably modulating current discharged from the negative electrical charge storage means for powering the discharge lamp;

wherein at least one of said current modulators comprises a current flow rate control means connected to controllably conduct current from a charge storage means to power said discharge lamp; and modulation control means for controlling said current flow rate control means; said current flow rate control means being a current gate controlled by the modulation control means to conduct pulses of electrical current from the charge storage means;

at least one positive current switching means connected to receive positive current from said positive electrical charge storage means and control positive current flow through said discharge lamp to define positive lamp discharge periods;

at least one negative current switching means connected to receive negative current from said negative electrical charge storage means and control negative current flow through said discharge lamp to define negative lamp discharge periods;

switching control means for controlling said positive and negative switching means so that positive lamp discharge periods do not occur simultaneously with negative lamp discharge periods;

wherein said pulses are provided at a modulation frequency which is at least 10 times more frequent than a lamp frequency at which the discharge lamp operates.

5,010,280

VERTICAL DEFLECTION CIRCUIT FOR CRT DISPLAY DEVICE

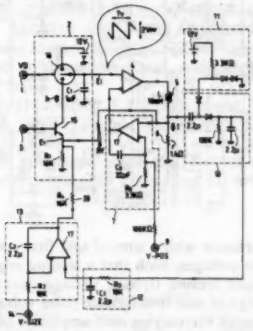
Masanori Ogino; Takeo Yamada, and Miyuki Ikeda, all of Kanagawa, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 26, 1990, Ser. No. 514,592

Claims priority, application Japan, May 29, 1989, 1-132604

Int. Cl.[5] H01J *29/70, 29/72*

U.S. Cl. 315—388 8 Claims



1. A vertical deflection circuit for a CRT display device, including a ramp wave signal generator having a vertical synchronizing signal input and a biasing terminal and an output circuit including an operational amplifier having an inverted input and a non-inverted input connected to an output of said ramp wave signal generator, said output circuit responsive to a ramp wave signal at an output of said ramp wave signal generator to drive a vertical deflection coil, said vertical deflection circuit comprising: first feedback means including amplitude detector means for detecting vertical deflection current amplitude and for feeding said vertical deflection current amplitude back to said ramp wave signal generator to thereby stabilize vertical size of a display image on a screen of said CRT device; second negative feedback means connected between said deflection coil and said inverted input of said output circuit for detecting a mean vertical deflection current and for feeding a detected mean vertical deflection current back to said output circuit to thereby stabilize a vertical position of said display image on said CRT screen and means for controlling amounts of feedback of said first feedback means and said second negative feedback means to thereby regulate vertical size and vertical position of said display image on said CRT screen variably.

5,010,281

HIGH VOLTAGE STABILIZATION CIRCUIT FOR VIDEO DISPLAY APPARATUS

Enrique Rodriguez-Cavazos, Indianapolis, Ind., assignor to RCA Licensing Corporation, Princeton, N.J.

Filed Apr. 30, 1990, Ser. No. 516,487

Int. Cl.[5] H01J *29/70;* H04N *5/63*

U.S. Cl. 315—411 13 Claims

1. A high voltage power supply of a video apparatus, comprising:

a source of an input signal at a frequency that is related to a deflection frequency;

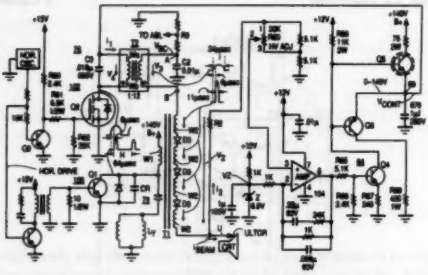
a first flyback resonant circuit that includes a deflection winding;

first switching means responsive to said input signal and coupled to said first flyback resonant circuit for generating a resonant first flyback pulse voltage at a frequency that is related to a deflection frequency that is developed across a high voltage winding of a flyback transformer;

a second flyback resonant circuit;

second switching means responsive to said input signal and

coupled to said second flyback resonant circuit for generating a resonant second flyback pulse voltage at a frequency that is related to said deflection frequency having a controllable amplitude, said second flyback pulse voltage being applied in series with said first flyback voltage to produce a high voltage pulse that is coupled to an electrode of a cathode ray tube having an amplitude that



is in accordance with a sum of said first and second flyback pulse voltages, such that a leading edge of a given pulse of said second flyback voltage occurs prior to a leading edge of said first flyback pulse voltage; and

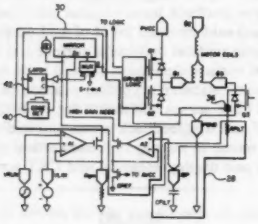
a control circuit for varying said amplitude of said second flyback pulse voltage in a manner that varies said amplitude of said high voltage pulse.

5,010,282

METHOD AND APPARATUS FOR DRIVING A DC MOTOR

Gregory O. Moberg, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 11, 1989, Ser. No. 350,870
Int. Cl.[5] H02P *6/02*
U.S. Cl. 318—254 **12 Claims**



1. A control circuit for a DC motor, said control circuit comprising:

a. driver means for applying a phase current to coils of a DC motor in accordance with a commutation sequence, said driver means including a plurality of FET current sink transistors, each transistors, each current sink transistor corresponding to one of said coils of said DC motor;

b. sensing means for sensing a drain-to-source voltage of one of said current sink transistors when an ON gate voltage is applied thereto by said driver means and applying said drain-to-source voltage across a drain and source of an FET reference transistor;

c. means for supplying said ON gate voltage to a gate of said FET reference transistor thereby inducing a reference current to flow through said FET reference transistor that is proportional to a current flowing through said current sink transistor that has said ON gate voltage applied thereto; and

d. means for generating a feedback current based on said reference current that is proportional to the drain-to-source voltage sensed by said sensing means and inversely proportional to a drain-to-source resistance of said FET reference transistor;

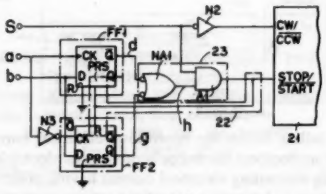
e. comparing means for comparing said feedback current to a secondary reference current and controlling an operating current level of said DC motor in response thereto.

5,010,283

MOTOR CONTROL CIRCUIT

Kimio Kitajima, and Hiroyuki Kiuchi, both of Komagane, Japan, assignors to Sankyo Seiki Mfg. Co., Ltd., Tokyo, Japan

Filed Jan. 12, 1990, Ser. No. 464,354
Claims priority, application Japan, Jan. 13, 1988, 1-6471
Int. Cl.[5] H02P *3/10*
U.S. Cl. 318—373 **12 Claims**



3. A motor control circuit for causing a motor to have a reduce stopping time comprising:

means for supplying n rotational signals whose relative phase differences are proportional to the rotational speed of a motor and are nominally related by 360°/n;

means for forming inverted signals from n-1 of said rotational signals;

a motor drive circuit;

means for supplying a signal to stop the motor;

rotational direction instruction means for controlling said motor drive circuit so that said motor is reversely rotated when said signal to stop said motor is supplied;

means for discriminating the direction of said motor and for determining, from said n signals and from said n-1 inverted signals, a predetermined initial flange of said n signals and n-1 inverted signals following a reversal of said motor and for supplying a signal to said motor drive circuit to de-energize said motor upon determining said initial change; and

means for holding said motor in a stopped condition following stopping of said motor.

8. A method for reducing the time for a motor to come to a complete stop comprising:

supplying a plurality of n rotational signals related to the rotational speed of a motor by the relative phase difference therebetween, the signals nominally being related by 360°/n;

forming n-1 inverted signals from said n rotational signals;

reversing the rotational direction of said motor in response to a signal to stop the motor;

determining, from said n signals and n-1 inverted signals, a predetermined initial change of any of said n rotational signals and n-1 inverted signals following a reversal of said motor;

de-energizing said motor upon determining said initial change; and

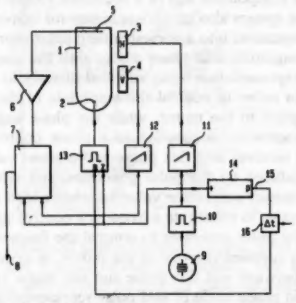
positively holding the motor in a stopped state after said motor has come to a complete stop.

5,010,284

DEVICE FOR THE OPTICAL RECORDING OF RAPID PROCESSES WITH A TV CAMERA

Wilhelm Heinz, Linkenheim, Fed. Rep. of Germany, assignor to European Atomic Energy Community, Luxembourg

Filed Nov. 17, 1989, Ser. No. 437,565
Claims priority, application Luxembourg, Nov. 18, 1988, 87392
Int. Cl.[5] G09G *1/04;* H01J *29/52*
U.S. Cl. 315—384 6 Claims



1. A device for the optical recording of rapid processes with at least one TV camera, which comprises means for deviating and suppressing a scanning beam, in order to make the scanning beam run successively and cyclically over N lines of a picture plane on which the processes are projected, line pulses being produced during scanning of said N lines, the device further comprising:

cyclic line counter means for carrying out one counting step for each of said line pulses and providing an end-of-count pulse after p line pulses, N/p being an integer $>>1$,

the TV camera having a beam suppression circuit with the end-of-count pulse being applied thereto for suppressing the scanning beam;

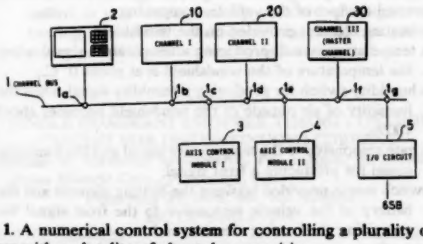
and a sawtooth generator, synchronized with the end-of-count pulse of the counter means, for controlling the vertical deviation of the scanning beam.

5,010,285

NUMERICAL CONTROL SYSTEM

Hideaki Kawamura, Hachioji; Kentaro Fujibayashi, Musashino, and Yosato Hitaka, Tokyo, all of Japan, assignors to Fanuc Ltd., Minamitsuru, Japan

PCT No. PCT/JP89/00225, § 371 Date Oct. 17, 1989, § 102(e) Date Oct. 17, 1989, PCT Pub. No. WO89/08876, PCT Pub. Date Sep. 21, 1989
PCT Filed Mar. 2, 1989, Ser. No. 425,175
Claims priority, application Japan, Mar. 9, 1988, 63-55761
Int. Cl.[5] G05B *19/18*
U.S. Cl. 318—569 3 Claims



1. A numerical control system for controlling a plurality of axes with a plurality of channels, comprising:

means for receiving machining programs;

means for receiving a single block signal;

means for interrupting a machining program of a first channel in response to said single block signal being received; and

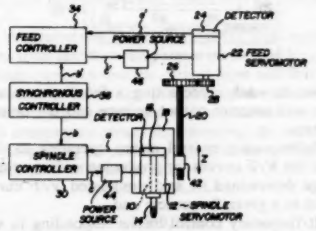
single block control means for controlling the channels so that when the machining program for the first channel is interrupted, machining programs for other channels are suspended.

5,010,286

METHOD OF SYNCHRONOUS CONTROL OF SPINDLE MOTOR AND FEED MOTOR

Kosei Nakamura; Shinichi Kono; Kazuhisa Numai, and Masami Kimijima, all of Yamanashi, Japan, assignors to Fanuc Ltd., Yamanashi, Japan

PCT No. PCT/JP88/00907, § 371 Date May 8, 1989, § 102(e) Date May 8, 1989, PCT Pub. No. WO89/02618, PCT Pub. Date Mar. 23, 1989
PCT Filed Sep. 9, 1988, Ser. No. 365,158
Claims priority, application Japan, Sep. 14, 1987, 62-228514
Int. Cl.[5] G05B *19/18*
U.S. Cl. 318—571 2 Claims



1. A method of control of a spindle servomotor during machining, with a feed servomotor movably connected to the spindle servomotor such that the feed servomotor translationally moves the spindle servomotor along a longitudinal axis of the spindle servomotor, wherein the spindle servomotor has a torque limit versus rotational speed function curve represented by a straight line over a first speed range and a hyperbola over a second speed range, said method comprising the step of:

(a) detecting a rotational speed of the spindle servomotor;

(b) moving the spindle servomotor along a longitudinal axis with a translational speed determined by a speed of the feed servomotor; and

(c) controlling the speed of the spindle servomotor in response to said torque limit function curve such that the spindle servomotor is accelerated over said first speed range along a straight line to have a constant torque and over said second speed range along a hyperbola line to have a decreasing torque so as to maintain a maximum torque of said spindle servomotor as said spindle is moved longitudinally.

5,010,287

INDUCTION MOTOR CONTROL SYSTEM

Tadayoshi Mukai, Izumi-Otsu, and Akira Yoshino, Seto, both of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Feb. 22, 1989, Ser. No. 313,461
Claims priority, application Japan, Feb. 24, 1988, 63-40997
Int. Cl.[5] H02P *5/34*
U.S. Cl. 318—801 8 Claims

1. An induction motor control system comprising:

an inverter for supplying a variable frequency AC voltage to drive said induction motor;

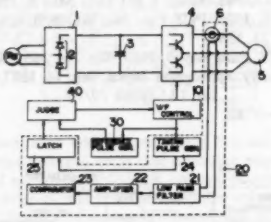
volt/frequency control means controlling said inverter to produce a suitable voltage and frequency in a predetermined relationship therebetween;

means for detecting a power factor phase angle between a motor current from said inverter and said inverter output voltage as indicative of an amount of load imposed on the motor;

means for producing a predetermined reference angle;

judge means comparing said detected power factor phase angle with said predetermined reference angle, which is a frequency dependent angle indicative of a standard load at a given frequency, in order to provide a control output in response to which said volt/frequency control section alters said inverter output voltage out of said predetermined relationship with the frequency for improving motor efficiency;

said volt/frequency control means operating to store a plurality of V/F curves, with respect to differing load requirements, each representing a functional relation between said inverter output voltage and the inverter frequency;



said volt/frequency control means operating to designate one of the V/F curves for producing said inverter output voltage determined by said designated V/F curve with respect to a given frequency; and

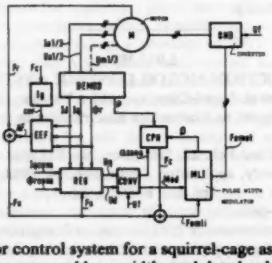
said volt/frequency control means responding to said first and second control outputs respectively to select from said V/F curves at least one curve having greater and lower inverter output voltages than said designated curve with respect to the given frequency for controlling said inverter to supply said greater and lower inverter output voltages while keeping the selected frequency substantially unchanged.

5,010,288

VECTOR CONTROL SYSTEM FOR A SQUIRREL-CAGE ASYNCHRONOUS ELECTRIC MOTOR

Pierre Poline, Trevoux, France, assignor to GEC Alsthom SA, Paris, France

Filed Mar. 21, 1990, Ser. No. 496,703
Claims priority, application France, Mar. 21, 1989, 89 03685
Int. Cl.[5] H02P *5/28*
U.S. Cl. 318—811 **4 Claims**



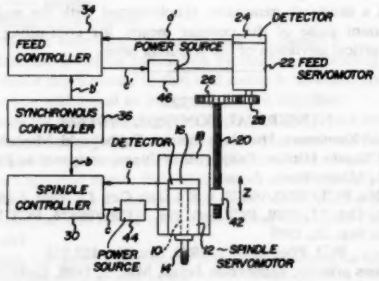
1. A vector control system for a squirrel-cage asynchronous electric motor powered by a width-modulated pulse generator controlling an inverter which converts a DC feed voltage into at least one AC feed voltage applied to the asynchronous motor, said AC voltage having an amplitude defining a current supplied by the generator to the motor and a flux in the motor, said system comprising means for evaluating magnitude and phase of flux in the motor relative to a fixed frame of reference, means for evaluating first in-phase and quadrature components, relative to said flux in the motor, of the current supplied to the motor, means for evaluating the speed of rotation of the motor, and means for evaluating the DC motor feed voltage, wherein the system further comprises means for determining second in-phase and quadrature components relative to said flux in the motor, which define a control voltage as a function of said first components and of a requested torque value, and wherein the system also comprises means for converting said second components into a corresponding polar representation having a magnitude and phase angle, with the magnitude of said polar representation being supplied directly to said pulse generator in order to control the amplitude of the AC feed voltage applied to the motor, while the phase angle of said polar representation is supplied to a phase control module which also receives said flux phase and a phase value of the voltage produced by the pulse generator, and which establishes a frequency correction value which is added to a stator frequency value to constitute a frequency control signal transmitted to the pulse generator to control the frequency of the AC voltage supplied thereby to the motor, in order that the difference between said flux phase and said phase value tends to equal said phase angle of said polar representation.

5,010,289

ANTI-FROST SYSTEM FOR A WINDSHIELD OF A MOTOR VEHICLE

Hirohisa Takada, Fukaya, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 19, 1990, Ser. No. 467,614
Claims priority, application Japan, Feb. 15, 1989, 1-37273
Int. Cl.[5] B60L *1/02*; B60S *1/54*
U.S. Cl. 322—8 **5 Claims**



1. A system for preventing frost from accumulating on a windshield of a motor vehicle having a battery and a wiper system including an intermittent wiper unit for intermittently operating a wiper of the vehicle, comprising

a heating element provided on the windshield;

a temperature switch producing a temperature signal when the temperature of the windshield is at about 0° C.;

a humidity switch for producing a humidity signal when the humidity of air outside of the windshield becomes about 100%;

a gate responsive to the temperature signal and the humidity signal for producing a frost signal;

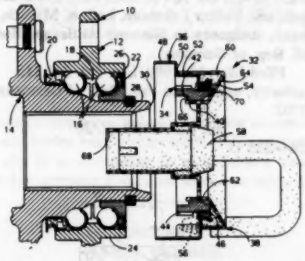
switch means provided between the heating element and the battery of the vehicle responsive to the frost signal for energizing the heating element; and

operating means responsive to the frost signal for operating the intermittent wiper unit.

5,010,290
EASILY INSTALLED WHEEL BEARING SENSOR PACKAGE

David A. Foster, Castalia, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Jul. 19, 1990, Ser. No. 554,484
Int. Cl.[5] G01P 3/44; G01B 7/30
U.S. Cl. 324—173 3 Claims



1. A self contained sensor package adapted to be installed to a bearing, said bearing having a stationary race and coaxial rotating race with an interior annular space between said races maintained by a complement of rolling elements contained within said annular space, said rotating race also having a cylindrical surface located outside of said annular space, said sensor package comprising,

a generally annular sensor ring having a cylindrical mounting surface sized so as to slide closely axially over said rotating race cylindrical surface, said sensor ring also having a magnetic portion, and a rubbing seal surface coaxial to said mounting surface located axially outboard of said magnetic portion,

a generally cylindrical casing adapted to be press fitted axially over said stationary race,

a seal secured to said casing and adapted to sealingly engage said sensor ring seal surface when said sensor ring and casing are maintained coaxial to one another, and,

a shipping and installation jig maintaining said sensor ring and casing in coaxial relation as a package, said jig including a first cylindrical shell press fitted tightly over the outside of said casing, a coaxial, second cylindrical shell fitted slidably over said sensor ring mounting surface, and an annular rim interconnecting said first and second shells at coaxial, circular hinge lines, so that said second shell may shift axially outwardly relative to said first shell while said first and second shells remain coaxial,

whereby said package may be installed to said bearing by sliding said casing axially over the outside of said stationary race as said sensor ring mounting surface simultaneously slides axially over said rotating race cylindrical surface, thereby pushing said jig second cylindrical shell off of said sensor ring and shifting it axially outboard of said first shell, after which said first shell may be removed from said casing, leaving said casing and sensor ring installed to said bearing axially outboard of said annular bearing space, with said sensor ring magnetic portion protected within said casing by said casing seal.

5,010,291
SINGLE QUADRANT CHOPPER TIMING CONTROL CIRCUIT FOR DISCONTINUOUS CURRENT

Charles W. Edwards, Monroeville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 29, 1990, Ser. No. 529,844
Int. Cl.[5] H02M 7/44
U.S. Cl. 323—222 7 Claims

7. A single quadrant chopper timing control circuit for providing discontinuous current, comprising:

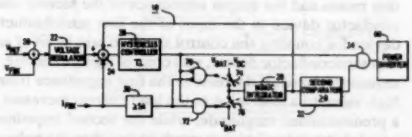
first summer means for summing a reference voltage and a feedback voltage and outputting a summed voltage;

voltage regulator means for receiving the summed voltage and outputting a current demand signal;

second summer means, for summing the current demand signal, a feedback current, and a mimic current, and outputting a summed current;

hysteresis controller means for receiving the summed current from said second summer means and outputting a hysteresis signal;

first comparator means for receiving a current, determining whether the current is below a predetermined value, and outputting a signal;



logic means for receiving the hysteresis signal and the signal from said first comparator means and outputting a logic signal;

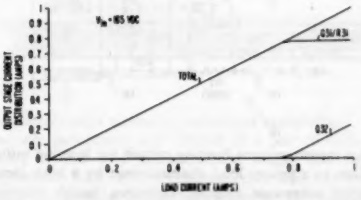
mimic integrator means for receiving the logic signal and the signal from said first comparator means and for outputting a mimic current when the current from said first comparator means is below the predetermined value, the mimic current being input to said second summer means; and

second comparator means for receiving the mimic current and outputting an enabling signal if the mimic current is greater than or equal to zero.

5,010,292
VOLTAGE REGULATOR WITH REDUCED SEMICONDUCTOR POWER DISSIPATION

Robert L. Lyle, Jr., Knoxville, Tenn., assignor to North American Philips Corporation, New York, N.Y.

Filed Dec. 12, 1989, Ser. No. 449,664
Int. Cl.[5] G05F 1/56
U.S. Cl. 323—274 6 Claims



1. A linear, series pass voltage regulator including an input for receiving an unregulated first DC voltage and including an output for supplying a variable load current at a regulated second DC voltage having a predetermined magnitude, said voltage regulator comprising:

a. a variable impedance output stage electrically connected between the input and the output for carrying the load current; and

b. control circuitry electrically connected to the voltage regulator input and to the output stage for comparing the second DC voltage to a reference voltage and for producing a control signal for controlling the impedance of the output stage to effect maintenance of the second DC voltage at the predetermined magnitude despite variations of the first DC voltage and the load current;

characterized in that the output stage comprises:

(1) a first impedance comprising a series combination of a resistor and a first semiconductor device output impe-

dance electrically connected between the input and the output of the regulator, said first semiconductor device having an input for receiving said control signal to effect variation of the device output impedance;

(2) a second impedance comprising a series combination of a second semiconductor device output impedance and voltage-dropping semiconductor means electrically connected between the input and the output of the regulator, said second semiconductor device having an input for receiving said control signal to effect variation of the device output impedance, said input of said second semiconductor device being electrically connected to the control circuitry for receiving the control signal; and

(3) resistive coupling means electrically connecting a junction between the voltage-dropping semiconductor junction means and the output impedance of the second semiconductor device to the input of the first semiconductor device for coupling the control signal to said input of said first semiconductor device, said control signal effecting, in sequence, a gradual decrease in the first impedance from a high value to a low value as the load current increases to a predetermined magnitude, while the second impedance remains at a value which is much higher than the value of the first impedance, followed by a gradual decrease in the second impedance from said higher value as the load current increases above said predetermined magnitude, while the first impedance remains at said low value.

5,010,293

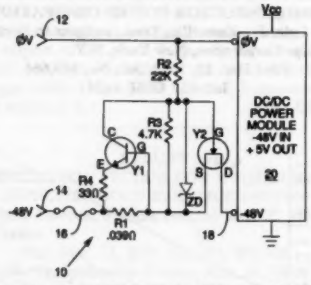
INRUSH CURRENT LIMITING CIRCUIT

William F. Ellersick, Redwood City, Calif., assignor to Raynet Corporation, Menlo Park, Calif.

Filed Nov. 20, 1989, Ser. No. 439,596

Int. Cl.[5] G05F *1/573*

U.S. Cl. 323—278 **13 Claims**



1. An inrush current limiting circuit for limiting initial current flow to a power load characterized by a high capacitive reactance otherwise causing excessive inrush current, the circuit comprising:

plug in connection means to a power source and two conductor paths leading from the plug in connection means,

power FET means having a source element to drain element path in series with one of the conductor paths and having a gate connection,

active current sense means for sensing excessive inrush current including bipolar transistor means connected to shunt the gate element of the power FET means to the potential at its source element when the bipolar transistor means is conducting, and sense resistor means in series with one of the conductor paths for controlling a base element of the bipolar transistor means to cause the bipolar transistor means to conduct when current through the sense resistor exceeds a predetermined amount, and,

bias resistor means connected to the gate element of the power FET means normally to bias the power FET means into full conduction between the source and drain elements when the bipolar transistor means is not conducting.

5,010,294

METHOD FOR TOPICALLY-RESOLVED DETERMINATION OF THE DIFFUSION LENGTH OF MINORITY CHARGE CARRIERS IN A SEMICONDUCTOR CRYSTAL BODY WITH THE ASSISTANCE OF AN ELECTROLYTIC CELL

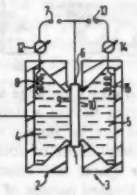
Helmut Foell, and Volker Lehmann, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed May 11, 1990, Ser. No. 522,115

Claims priority, application Fed. Rep. of Germany, May 31, 1989, 3917702

Int. Cl.[5] G01R *31/26*

U.S. Cl. 324—158 D **4 Claims**



1. A method for determining the diffusion length L of minority charge carriers in a semiconductor crystal body carrying an ohmic contact, comprising the steps of:

applying a measuring cell having an electrode therein to one side of the semiconductor crystal body so that a first surface thereof is exposed to the interior of the measuring cell;

filling the measuring cell with electrolyte so that the surface and the electrode are in contact with the electrolyte;

applying a voltage between the electrode and the ohmic contact to produce an inhibiting space charge zone at the first surface of the semiconductor crystal body;

irradiating the surface with light having a predetermined wavelength $\lambda > 800$ nm to produce a photocurrent I_l between the first surface and the electrode;

measuring the photocurrent I_l; and

determining the diffusion length L from the equation

$$I_l/I_{l,max}=(\alpha L/(1+\alpha L))\, e^{-\alpha w}$$

where α is the absorption coefficient for radiation having the predetermined wavelength λ, w is the expanse of the inhibiting space charge zone, and $I_{l,\ max}$ is a calibrated current obtained from a known specimen having an extremely long diffusion length.

5,010,295

BALL SCREW SUPPORTED Z STAGE

William B. Lindsay, Mountain View, Calif., assignor to General Signal Corporation, Stamford, Conn.

Filed Jan. 14, 1989, Ser. No. 365,878

Int. Cl.[5] G01R *1/02, 1/04*

U.S. Cl. 324—158 R **9 Claims**

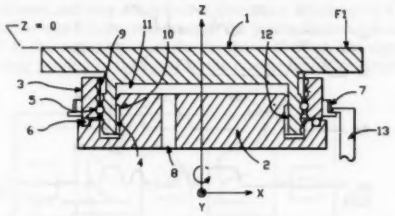
1. In a wafer prober, a support stage comprising p1 a chuck top for supporting an external load, said chuck top adapted to be movable up and down with respect to the Z axis,

ball screw means for supporting said chuck top wherein said balls crew means include an outer race and an inner race with corresponding matching helical grooves, one or more spiral rows of balls, a cylindrical ball retainer and an array of balls for supporting said outer race,

a base for supporting said ball screw means,

means for applying a vertical preload to said chuck top which is greater than said external load,

said ball screw means including means for radially constraining said chuck top in the XY plane,



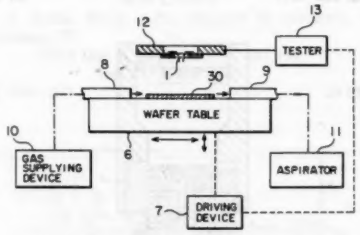
said means for applying including a piston connected to said base, a cylinder bore connected to said inner race with a close slip fit to said piston so as to form a chamber, and means for applying a vacuum source to said chamber.

5,010,296

WAFER PROBER

Kazuhisa Okada, Itami, and Ichirou Kusumoto, Kawanishi, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Mar. 12, 1990, Ser. No. 492,051
Claims priority, application Japan, Dec. 13, 1989, 1-321470
Int. Cl.[5] G01R *1/06, 31/02*
U.S. Cl. 324—158 P **7 Claims**



1. A wafer prober comprising:

supporting means for supporting a wafer having a plurality of electrode pads disposed on a surface thereof;

a plurality of probes for contacting respective electrode pads on a wafer supported by said supporting means;

a nozzle having a nozzle opening for spraying a gas onto the electrode pads on the wafer contacted by said probes; and

a suction duct having a duct opening for aspirating waste generated by contacting said plurality of probes with the plurality of electrode pads on the wafer and carried by gas sprayed through said nozzle wherein said nozzle opening and said duct opening are disposed directly opposite each other and said plurality of probes are disposed therebetween.

5,010,297

AUTOMATIC TEST EQUIPMENT WITH ACTIVE LOAD HAVING HIGH-SPEED INHIBIT MODE SWITCHING

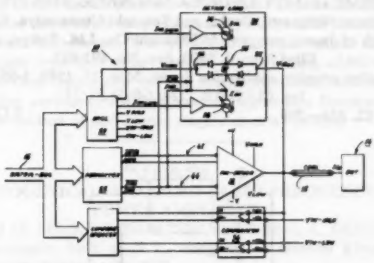
Douglas W. Babcock, Londonderry, N.H., assignor to Analog Devices, Incorporated, Norwood, Mass.

Filed Dec. 1, 1989, Ser. No. 444,815
Int. Cl.[5] G01R *19/00*
U.S. Cl. 324—158 R **10 Claims**

1. For use in apparatus for automatically testing multi-pin ICs by applying signals to selected pins and measuring the output response at other pins to each of which is connected an active load of the type including a diode commutation circuit having a supply terminal and an output terminal to be connected to a pin of the device under test; said active load comprising:

first and second matched transistor switch circuits arranged when activated to supply equal output currents;

means connecting the output of one of said transistor switch circuits to said supply terminal of said diode commutation circuit so that when that one transistor switch circuit is



turned on its output current can flow through said diode circuit to the corresponding pin connected to said output terminal of said active load;

means connecting the output of the other transistor switch circuit to a return line; and

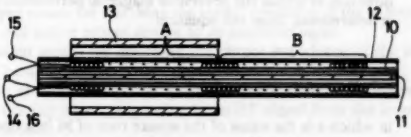
means to regulate the magnitudes of said equal currents through said first and second transistor switch circuits.

5,010,298

VARIABLE INDUCTANCE DISPLACEMENT MEASURING DEVICE WITH SLIDABLE METAL SLEEVE AND FERRITE BEAD CORE

Saburo Uemura, Yokohama, Japan, assignor to Macome Corporation, Tokyo, Japan

Filed Jun. 26, 1989, Ser. No. 371,742
Claims priority, application Japan, Oct. 27, 1988, 63-271434
Int. Cl.[5] G01B *7/14;* **G08C** *19/08;* **H01F** *27/24*
U.S. Cl. 324—207.19 **5 Claims**



1. A displacement measuring apparatus comprising:

a variable inductance coil formed of a pair of coils, each being wound at a predetermined length and disposed adjacent to each other in their axial directions about a core made of a material having high magnetic permeability and being covered by a protective tube and a slidable metal sleeve disposed over said inductance coil, said sleeve being of substantially the same length of one of said coils and being coupled to an object to be measured for movement in response thereto, said core being made of a metal wire and a plurality of ferrite beads connected in series and covering said metal wire; and

a detecting circuit comprising a high frequency pulse oscillator, the said pair of coils of said variable inductance coil, a pair of resistors, and a pair of rectifiers, said pair of coils being connected together at their one ends to one output terminal of said oscillator, said pair of resistors being connected at their one ends to the other ends of said pair of coils, respectively, while being connected together at their other ends to the other output terminal of said oscillator, said pair of rectifier rectifying voltages produced across said pair of resistors and delivering a difference voltage therebetween, wherein when said metal sleeve is

slidably moved, said detecting circuit generating a direct current voltage in correspondence with the displacement of said metal sleeve.

5,010,299

METHOD FOR MEASURING STRESS ON STEEL BY DETERMINING THE REVERSE MAGNETIC PERMEABILITY UNDER A MAGNETIC BIAS FIELD

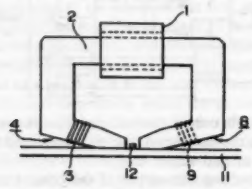
Hidekazu Nishizawa, Osaka, and Tomoaki Utsunomiya, Ehime, both of Japan, assignors to Nikkoshi Co., Ltd., Tokyo, Japan

Filed Mar. 9, 1990, Ser. No. 491,423

Claims priority, application Japan, Mar. 17, 1989, 1-65364

Int. Cl.[5] G01B *7/24*; G01R *33/18*

U.S. Cl. 324—209 **2 Claims**



1. A method for the determination of a stress in a steel material which comprises the steps of:

(a) determining the reversible magnetic permeability μ by using a stress detector of steel materials utilizing the phenomenon of magnetostriction under a magnetic bias field H_0 within the range of approach to the saturation magnetization;

(b) calculating the value of M, which is the first-order factor on $1/H_0^3$ for the reversible magnetic permeability μ of the steel material in the equation $\mu = 1 + M/H_0^3$, utilizing the values of μ; and

(c) calculating the values of a principal stress σ_1 in the steel material, the other principal stress σ_2 in the steel material which is in the direction perpendicular to the direction of σ_1 and the angle θ between the direction of σ_1 and the direction at which the reversible magnetic permeability μ is determined, from the equation

$$\sqrt{M} = a + b[(\sigma_1 + \sigma_2) + 3(\sigma_1 - \sigma_2)\cos 2\theta],$$

in which a is the value of the square root of M in a stress-free state and b is the stress sensitivity.

5,010,300

MULTI-AXIS PRE-SATURATED SPIN ECHO PHASE ENCODED SPECTROSCOPY

Martyn N. J. Paley, Mayfield Village; James B. Murdoch, Solon; David A. Lampman, Lakewood, and James M. McNally, Chagrin Falls, all of Ohio, assignors to Picker International, Inc., Highland Hts., Ohio

Continuation-in-part of Ser. No. 7,392,480, Aug. 11, 1989. This application Nov. 22, 1989, Ser. No. 440,894

Int. Cl.[5] G01R *33/20*

U.S. Cl. 324—309 **15 Claims**

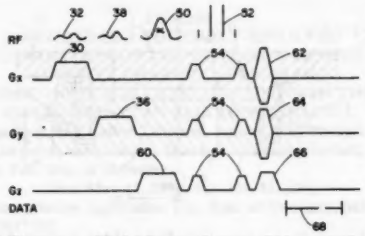
1. A method of magnetic resonance spectroscopy comprising:

defining a region of interest by pre-saturating regions thereabout;

exciting resonance in the region of interest;

encoding spatial locations along at least one direction by phase encoding the excited resonance along the selected direction;

collecting resonance data in the absence of a magnetic field gradient and Fourier transforming the collected data into an array of spectra, each spectrum corresponding to the



resonance signal from a spatial section along the phase encode direction.

5,010,301

METHOD FOR DETERMINING THE SWELLING CLAY CONTENT OF CEMENT MIXTURES BY DIELECTRIC MEASUREMENTS

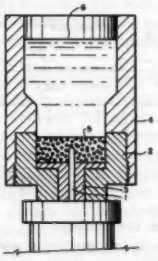
Peter K. Leung, Sugar Land; Ronald P. Steiger, and Kenneth R. Kunze, both of Houston, all of Tex., assignors to Exxon Production Research Company, Houston, Tex.

Filed Aug. 22, 1989, Ser. No. 397,053

The portion of the term of this patent subsequent to Oct. 24, 2006, has been disclaimed.

Int. Cl.[5] G01V *3/06, 3/12*

U.S. Cl. 324—376 **21 Claims**



1. A method for measuring the swelling-clay content of wet cement mixtures by dielectric measurements, comprising the steps of:

(a) washing a wet cement mix sample with a fluid having a water activity substantially less than that of water;

(b) packing the washed cement mix sample into a sample cell suitable for dielectric measurement;

(c) measuring the dielectric constant at a preselected frequency; and

(d) comparing the measured dielectric constant of the cement mix sample to a calibration curve to determine the swelling-clay content.

5,010,302

CHARGE AMPLIFIER CIRCUIT

Peter W. Krempl, Kainbach; Guenther Wegscheider, and Gerhard Woess, both of Graz, all of Austria, assignors to AVL Gesellschaft fuer Verbrennungs-kraftmaschinen und Messtechnik m.b.H., Prof. Dr. Dr. h.c. Hans List, Austria

Filed Sep. 1, 1989, Ser. No. 401,822

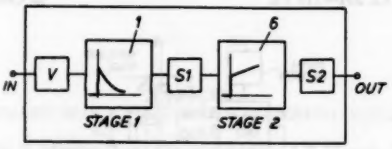
Claims priority, application Austria, Sep. 2, 1988, 2171/88

Int. Cl.[5] H03F *3/191*

U.S. Cl. 330—107 **7 Claims**

1. A charge amplifier circuit having an input and an output, comprising:

(a) a first stage including an operational amplifier having a signal output that is fed back to a signal input of the operational amplifier via a feedback element including a capacitor and which exhibits a finite resistance, the feedback element defining a break-over frequency f_I defined as $\frac{1}{2}\pi$ RC where R is the resistance of the feedback elements and C is the capacitance of the feedback element, the signal input serving as the input of the charge amplifier circuit;



(b) a second stage including a proportional-integrating (PI) unit having an input coupled to the signal output of the operational amplifier and an output that serves as the output for the charge amplifier circuit, the PI unit having a break-over frequency f_{II}, the frequency f_{II} being substantially equal to the frequency f_I; and

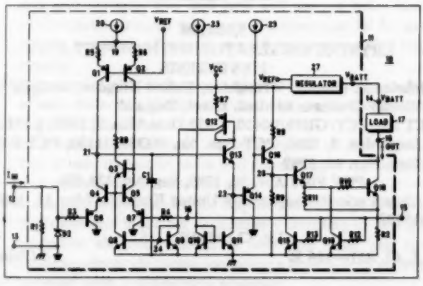
(c) whereby, no signal proportional to the output of the second stage is fed back to the signal input of the first stage.

5,010,303

BALANCED INTEGRATED CIRCUIT DIFFERENTIAL AMPLIFIER

Jeffrey J. Braun, Mesa, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 8, 1989, Ser. No. 447,956
Int. Cl.[5] H03F 3/45
U.S. Cl. 330—257 **20 Claims**



1. An integrated circuit differential amplifier comprising:

differential input stage means including at least a pair of first and second semiconductor devices each having an input electrode, an output electrode and a common electrode, the common electrodes being connected to each other, said input stage means providing at one of said output electrodes a differential signal related to the difference between two input signals each separately coupled to a different one of said input electrodes;

output stage means having an input terminal connected to said one output electrode of said input stage means for amplifying said differential signal and providing said amplified differential signal as an output signal at an output terminal of said output stage means, said output stage means inherently providing a predetermined impedance and current load at said one output electrode of said input stage means by virtue of its connection thereto,

wherein the improvement comprises,

current mirror circuitry for developing a current mirror signal substantially corresponding to output current drawn through said output stage means regardless of any current drawn by any additional circuitry connected to said output terminal; and

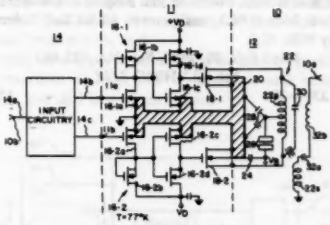
load balancing circuit means having current there through determined by said current mirror signal and having an input terminal directly coupled to and loading another one of said input stage output electrodes, wherein said balancing circuit means provides at its input terminal an impedance and current load substantially identical to the impedance and current load provided by said output stage means regardless of any current drawn by any additional circuitry connected to said output terminal, whereby offset variation of said differential signal as a function of conduction of said output stage means is reduced.

5,010,304

CRYOGENICALLY-COOLED RADIO-FREQUENCY POWER AMPLIFIER

Otward M. Mueller, Ballston Lake, and William A. Edelstein, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Nov. 3, 1989, Ser. No. 431,361
Int. Cl.[5] H03F 3/26, 3/16
U.S. Cl. 330—269 **14 Claims**



1. A radio-frequency (RF) power amplifier, comprising:

at least one active solid-state RF power device, having an input impedance and an output impedance;

input means for matching the input impedance of the at least one active power device to an amplifier input;

output means for matching the output impedance of the at least one active power device to an amplifier output;

the at least one power device further comprising active driving means responsive to an RF signal from the input means;

the power amplifier further comprising substrate means, with high thermal conductivity, for supporting the at least one active power device; and

cryogenic means, contacting at least the substrate means, for removing thermal energy from the at least one active power device.

5,010,305

MICROWAVE INTEGRATED CIRCUIT

Nobuo Shiga, Yokohama, Japan, assignor to Sumitomo Electric Industries, Ltd., Japan

Filed Dec. 7, 1989, Ser. No. 447,062
Claims priority, application Japan, Dec. 22, 1988, 63-324357
Int. Cl.[5] H03F 3/16, 3/60
U.S. Cl. 330—277 **18 Claims**

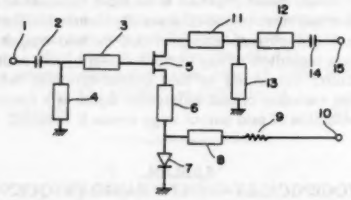
1. A microwave integrated circuit having a plurality of circuit components integrated therein, comprising:

initial stage amplification means having a field effect transistor;

series circuit means having an inductive element connected in series with a variable capacitance element, one end of said series circuit means being connected to a source of

said field effect transistor and the other end being connected to ground, and

control means including a circuit with a microstrip and a resistor which are serially connected for controlling the capacitance of said variable capacitance element by an external signal,



one end of said control means being connected to a junction of said variable capacitance element and said inductive element and said external signal being applied to the other end of said control means.

5,010,306

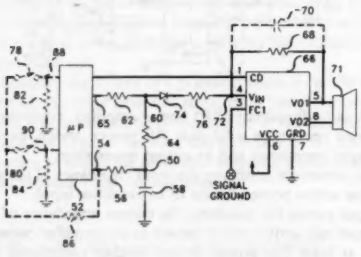
LOW COST DIGITAL AMPLITUDE REGULATOR

Walter G. Kutzavitch, Freehold, and Eugene J. Rosenthal, Highland Park, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Feb. 20, 1990, Ser. No. 482,442

Int. Cl.[5] H03G *3/18*

U.S. Cl. 330—284 **15 Claims**



1. Apparatus for digitally regulating the magnitude of an output signal derived from an input signal comprising:

means for generating a stream of pulses with a controllable variable duty cycle;

means for controlling said duty cycle of said pulses;

means for supplying said generated stream of variable duty cycle pulses;

first means for filtering said supplied stream of variable duty cycle pulses to develop a DC voltage, the magnitude of said DC voltage being responsive to and proportional with the duty cycle of said stream of pulses;

an input signal source for supplying said input signal;

means for devloping a composite output signal containing components of said input signal and said DC voltage;

a source of a predetermined threshold level;

second means supplied with said composite output signal and being responsive to said predetermined threshold level for filtering any portion of said composite signal the magnitude of which is below said threshold level and for supplying as an output a filtered version of said composite signal; and

amplifier means for amplifying said output of said second means to generate an output signal having a prescribed output magnitude.

5,010,307

OSCILLATOR HAVING PERIODICALLY PULSED CRYSTAL

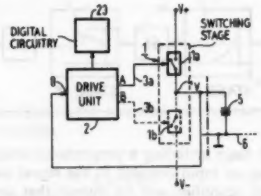
Hans G. Strandberg, Sundbyberg, Sweden, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Jan. 19, 1990, Ser. No. 467,180

Claims priority, application European Pat. Off., Jan. 20, 1989, 89100970.6

Int. Cl.[5] H03B *5/36*

U.S. Cl. 331—116 FE **10 Claims**



1. An oscillator circuit for use with a supply line at a voltage having a polarity and a line at reference potential, said oscillator circuit comprising:

a crystal having a first terminal connected to said line at reference potential, and a second terminal;

switch means having an output directly connected to said second terminal of said crystal, a control input, and being connected to said supply line for, when closed, connecting said supply line to said crystal to energize said crystal so that said crystal generates an output signal which executes a periodic oscillation; and

drive means having an input connected to said output of said switch means and having an output connected to said control input of said switch means for closing said switch means for a fraction of a half-period of said periodic oscillation during those half-periods which have the same polarity as said supply line voltage.

5,010,308

CRYSTAL OSCILLATOR WITH OFFSET AND HYSTERESIS

Nicholas P. Cowley, Wroughton, United Kingdom, assignor to Plessey Overseas Limited, Ilford, England

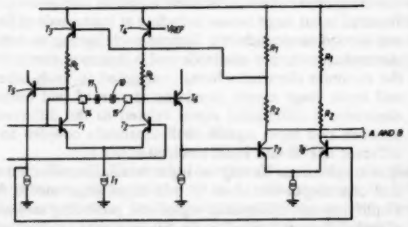
PCT No. PCT/GB89/00420, § 371 Date Mar. 7, 1990, § 102(e) Date Mar. 7, 1990, PCT Pub. No. WO89/11180, PCT Pub. Date Nov. 16, 1989

PCT Filed Apr. 20, 1989, Ser. No. 438,453

Claims priority, application United Kingdom, May 11, 1988, 8811193

Int. Cl.[5] H03B *5/36*

U.S. Cl. 331—116 R **3 Claims**



1. A crystal oscillator comprising a pair of differentially arranged transistors to the bases of which an input signal may be differentially applied, a crystal and a capacitor being connectable between the collector of a first of the transistors and the base of a second of the transistors, the oscillator outputs being provided differentially on the collectors of the first and

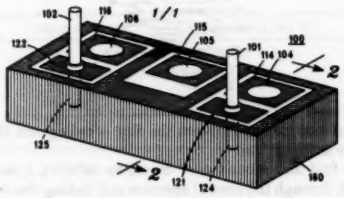
second transistors, and a feedback loop established by an output of one of the transistors serving to drive a further transistor connected as a load in the collector of the other of the transistors.

5,010,309

CERAMIC BLOCK FILTER WITH CO-FIRED COUPLING PINS

Keith R. Manssen, Long Grove, and Michael F. Moutrie, Buffalo Grove, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 22, 1989, Ser. No. 455,725
Int. Cl.[5] H01P *1/202*
U.S. Cl. 333—206 **12 Claims**



1. A filter, comprising:

a dielectric block having top, bottom and side surfaces and having at least first and second holes each extending from the top surface toward the bottom surface, said bottom and said surfaces and said first and second holes being substantially covered with a conductive material for producing producing first and second transmission line resonators;

first resonator electrode means disposed on the top surface of said dielectric block and connected to the conductive material of said first hole;

second resonator electrode means disposed on the top surface of said dielectric block and connected to the conductive material of said second hole;

first coupling electrode means disposed on the top surface of said dielectric block for capacitively coupling to said first resonator electrode means of said first hole, said first coupling electrode means including a hole having surfaces covered with a conductive material;

second coupling electrode means disposed on the top surface of said dielectric block for capacitively coupling to said second resonator electrode means of said second hole, said second coupling electrode means including a hole having surfaces covered with a conductive material;

a first coupling pin having a portion disposed in the hole in said first coupling electrode means;

a second coupling pin having a portion disposed in the hole in said second coupling electrode means; and

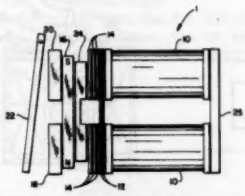
said conductive material and said first and second coupling pins having been simultaneously co-fired for bonding said conductive material to said dielectric block, for bonding said first coupling pin to the conductive material of said first coupling electrode means and hole in said first coupling electrode means, and for bonding said second coupling pin to the conductive material of said second coupling electrode means and hole in said second coupling electrode means.

5,010,310

ALTERNATING CURRENT IMMUNIZED RELAY AND METHOD OF IMMUNIZING A RELAY TO ALTERNATING CURRENT

Klaus H. Frielinghaus, Rochester, N.Y., assignor to General Signal Corporation, Stamford, Conn.

Filed Jun. 16, 1988, Ser. No. 208,181
Int. Cl.[5] H01F *7/10*
U.S. Cl. 335—243 **7 Claims**



1. A relay apparatus which comprises:

an armature;

means for pivotally mounting said armature;

first and second pole pieces dimensioned, configured and disposed for cooperation with said armature;

a magnetic circuit including at least one coil;

a plurality of iron shunt lamina spanning said magnetic circuit intermediate at least said one coil and said first and second pole pieces; and

a plurality of copper washer slugs in said magnetic circuit intermediate at least one of said first and second pole pieces and said iron shunt lamina.

5,010,311

ELECTRONIC MODULATION OF MAGNETIC FIELDS

Aharon Z. Hed, Nashua, N.H., assignor to International Superconductor Corp., Riverdale, N.Y.

Filed Feb. 22, 1989, Ser. No. 314,426
Int. Cl.[5] H01F *7/22*
U.S. Cl. 335—216 **18 Claims**

1. A method of modulating a magnetic field, comprising the steps of:

(a) establishing a magnetic field to be modulated;

(b) inserting into said magnetic field a generally flat solid body of a superconductive material having a critical temperature T_c below which the body is superconductive, a critical current density J_c at which said body has a transition between superconductive and nonsuperconductive states and a critical magnetic field H_c which is a function of temperature and current and above which superconductivity of said body is quenched to a mixed state transitting to the nonsuperconductive state said body being positioned to have its major dimensions in a plane perpendicular to said field; and

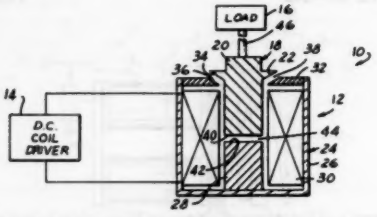
(c) controllably periodically or intermittently and reversibly altering the state of said body from one of said states to another of said states, thereby modulating said magnetic field.

5,010,312

SOLENOID ACTUATORS

Krystyn Motykiewicz, Southington, Conn., assignor to Rostra Engineered Components, Waterbury, Conn.

Filed Apr. 10, 1990, Ser. No. 507,025
Int. Cl.[5] H01F 7/08
U.S. Cl. 335—261 12 Claims



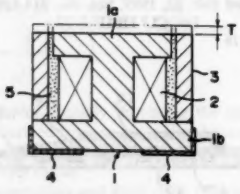
1. A solenoid actuator that comprises: an armature including a ferromagnetic body mounted for movement through a stroke along a defined axis, and a stator including an electrical coil surrounding said axis and a ferromagnetic stator body having a first portion axially opposed to said armature body and a second portion radially surrounding and spaced from said armature body, characterized in that said armature further includes ferromagnetic means moveably mounted on said armature body radially adjacent and opposed to said second portion of said stator body, said means and said second portion of said stator body having opposed axially overlapping tapering surfaces that are symmetrical with respect to said axis.

5,010,313

CHIP COIL

Toshimi Kaneko; Tetsuya Morinaga, and Tetsuo Hatakenaka, all of Nagaokakyo, Japan, assignors to Murata Manufacturing Co., Ltd., Nagaokakyo, Japan

Filed May 30, 1990, Ser. No. 530,402
Claims priority, application Japan, Jun. 2, 1989, 1-141896
Int. Cl.[5] H01F 3/00
U.S. Cl. 335—296 3 Claims



1. A chip coil comprising:
a core made of a magnetic material;
a coil wound around the core;
a sleeve core enclosing the coil, the sleeve core made of a magnetic material,
wherein the upper surface of the core and the upper surface of the sleeve core are ground so as to adjust the inductance of the chip coil.

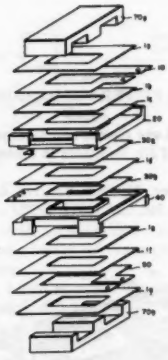
5,010,314

LOW-PROFILE PLANAR TRANSFORMER FOR USE IN OFF-LINE SWITCHING POWER SUPPLIES

Alexander Estrov, Newton, Mass., assignor to Multisource Technology Corp., Waltham, Mass.

Filed Mar. 30, 1990, Ser. No. 502,523
Int. Cl.[5] H01F 27/30
U.S. Cl. 336—198 3 Claims

1. A transformer assembly comprising:
a. first and second bobbin members of insulating material, each said bobbin member having a pair of opposed planar surfaces defining a central aperture therein, at least one of the bobbin members having a raised wall extending from each surface and encircling said aperture;
b. a first planar conductive winding disposed adjacent a first surface of the at least one bobbin member;
c. a second planar conductive winding disposed adjacent a second surface of the at least one bobbin member;



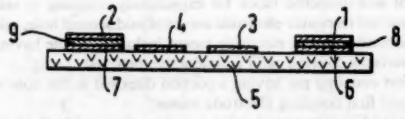
d. first and second core members;
e. insulation means between the first winding and the first core member; and
f. the first and second core members defining a magnetic path through the central aperture and linking the first and second windings.

5,010,315

THERMAL RADIATION SENSOR

Horst Fedter, Bühlertal; Werner Grünwald, Gerlingen; Peter Nolting, Bühlertal; Claudio de la Prieta, Stuttgart, and Kurt Schmid, Ditzingen-Schöckingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

PCT No. PCT/DE88/00134, § 371 Date Aug. 18, 1989, § 102(e) Date Aug. 18, 1989, PCT Pub. No. WO88/07180, PCT Pub. Date Sep. 22, 1988
PCT Filed Mar. 10, 1988, Ser. No. 425,166
Claims priority, application Fed. Rep. of Germany, Mar. 20, 1987, 3709201
Int. Cl.[5] H01C 7/06
U.S. Cl. 338—7 4 Claims



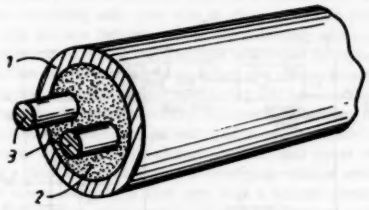
1. Thermal radiation sensor comprising two receiver surfaces which are exposed to the radiation, one receiver surface (1) having a high absorption capacity with reference to the thermal radiation, the other (2) having a low absorption capacity, both receiver surfaces comprise a NTC resistance material and are combined in a bridge circuit together with two temperature-independent resistors (3 and 4), characterized in that the NTC resistors (1) and (2) comprise underlying heating layers (6) and (7) which keep the two NTC resistors at a constant temperature.

5,010,316

THERMOCOUPLES OF ENHANCED STABILITY

Noel A. Burley, Melbourne, Australia, assignor to Bell-TRH Limited, New South Wales, Australia

Filed Feb. 24, 1988, Ser. No. 159,923
Claims priority, application Australia, Oct. 23, 1987, PI5032
Int. Cl.[5] H01C 1/03
U.S. Cl. 338—238 10 Claims



1. Mineral insulated, metal-sheathed (MIMS) cable in which the sheath alloy has the following composition:

Element	Concentration (wt %)
Cr	14.0 ± 0.5
Nb	3.5 ± 1.5
Si	1.4 ± 0.1
Mg	0.15 ± 0.05
Ce	0.05 ± 0.05
Ni	balance

5,010,317

SATELLITE BASED SIMULCAST PAGING SYSTEM

Robert J. Schwendeman, Pompano Beach, and William J. Kuznicki, Coral Springs, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 30, 1989, Ser. No. 444,457
Int. Cl.[5] H04Q 1/30
U.S. Cl. 340—311.1 30 Claims

12. A simulcast paging communication system, comprising:

a plurality of terrestrial receivers, at least some of which are capable of receiving paging information simulcast from at least one satellite and one or more terrestrial stations;

the terrestrial stations being capable of simulcasting the paging information with at least one satellite, and capable of adapting the paging information so as to be compatible with at least one of the plurality of terrestrial receivers; and

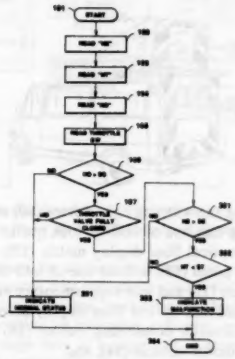
at least one satellite capable of simulcasting the paging information to at least one terrestrial station for reception by at least one of the plurality of terrestrial receivers.

5,010,318

SYSTEM FOR DETECTING MALFUNCTION OF TURBINE SPEED MEASURING DEVICE FOR TORQUE CONVERTER OF AUTOMOTIVE AUTOMATIC TRANSMISSION

Hiroshi Yamaguchi, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Mar. 19, 1990, Ser. No. 495,123
Claims priority, application Japan, Apr. 19, 1989, 1-99836
Int. Cl.[5] B60Q 9/00; G08B 21/00
U.S. Cl. 340—439 6 Claims



1. In a unit including an engine, a torque converter and a transmission gear train,

a first sensor issuing a first information signal representative of the rotation speed of an output means of said engine;

a second sensor issuing a second information signal representative of the rotation speed of an output means of said torque con[illegible]er;

a third sensor issuing a third information signal representative of the rotation speed of an output means of said transmission gear train;

first means for respectively determining first, second and third reference minimum speeds of the respective output means of said engine, said torque converter and said transmission gear train; and

second means for issuing an alarm signal when the rotation speed derived from said first information signal is higher than said first reference minimum speed, the rotation speed derived from said third information signal is higher than said third reference minimum speed and the rotation speed derived from said second information signal is lower than said second reference minimum speed.

5,010,319

WARNING LIGHT DEVICE

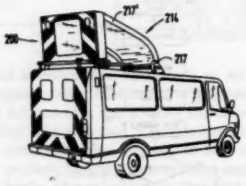
Erich Killinger, Gaggenau, Fed. Rep. of Germany, assignor to Dambach-Werke GmbH, Fed. Rep. of Germany

Filed Oct. 2, 1989, Ser. No. 416,061
Claims priority, application Fed. Rep. of Germany, Oct. 1, 1988, 3833544
Int. Cl.[5] B60Q 1/26
U.S. Cl. 340—472 6 Claims

1. A warning light device having a warning panel (25), for regulating traffic, attached in a vertical position near a rear of a motor vehicle and various traffic symbols being displayed on said warning panel (25) with controllable electric luminous elements, the warning light device comprising: said warning panel (25) having a controllable optical fiber display matrix

(12), said matrix having a plurality of optical fiber bundles (50, 51) illuminated at one end by individually triggerable light sources (40–43) to define said various traffic symbols, and said optical fiber bundles (50, 51) at their opposite ends having free ends of individual optical fibers (29–32) near said optical fiber display matrix (12), said free ends terminating in positions to display said various traffic symbols (17, 18), said warning panel (25) being attached to a roof of and extending to said rear of said motor vehicle (14);

at least one of an electric power supply system (11) of said motor vehicle (14) and a supplementary electric power pack (23) mounted in said motor vehicle (14) for supplying power to the warning light device (10), an operating panel (13) disposed near a dashboard of said motor vehicle (14)



for switching the warning light device (10) on and off and for initiating displays of said various traffic symbols (17, 18) on said optical fiber display matrix (12);

said operating panel (13), at least one of said electric power supply system (11) and said supplementary electric power pack (23), and said optical fiber display matrix (12) being connected through connecting cables (16, 19) installed within said motor vehicle (14); and

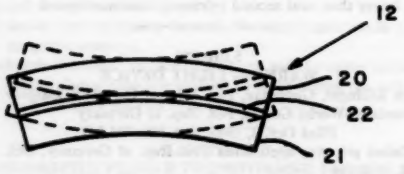
a spoiler (214) pivotally attached to a rooftop stand construction, remote from a swivel shaft of a holder (202), said spoiler (214) covering said optical fiber display matrix (12) which is folded onto said roof both in an operating position and in a folded-down position, with a cross section of said spoiler (214) converging toward a front of said motor vehicle (14).

5,010,320

SELF MODULATING ELECTRONIC ARTICLE SURVEILLANCE MARKER

Robert A. Cordery, Danbury, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Dec. 8, 1989, Ser. No. 448,183
Int. Cl.[5] G08B *13/24*
U.S. Cl. 340—551 10 Claims



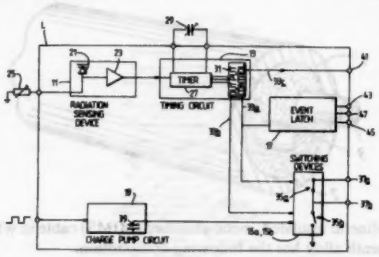
1. In an electronic surveillance marker that includes a magnetostrictive first element adapted to experience a dimensional change in a first direction in the presence of a magnetic field, the improvement comprising a second element firmly affixed to said first element, said second element being of a substantially non-magnetostrictive material, whereby said first element bends in the presence of a magnetic field and said bending varies the susceptibility of said first element.

5,010,321

NUCLEAR EVENT DETECTORS

David J. Larner, Lynsted, and Clive D. Goodchild, Northfleet, both of England, assignors to Gec-Marconi Limited, England

Filed Oct. 2, 1989, Ser. No. 416,052
Claims priority, application United Kingdom, Oct. 5, 1988, 8823398
Int. Cl.[5] G08B *17/12*
U.S. Cl. 340—600 4 Claims



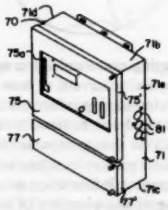
1. A nuclear event detector for use in the protection of electronic equipment having a plurality of devices, comprising: radiation sensing means for producing an output in response to the incidence thereon of radiation above a threshold level; timing circuit means responsive to the output of the sensing means for producing first and second control signals; a first terminal for connection to a first power supply line for first devices of the equipment which are not to be protected on the occurrence of a nuclear event; a second terminal for connection to a second supply line for second devices of the equipment which are to be protected on the occurrence of a nuclear event; controllable first electrical switching means for providing a normally closed first switch path between said first and second terminals; and controllable second electrical switching means for providing a normally open second switch path between said second terminal and ground; said first and second switching means being controlled by said first and second control signals respectively so that in response to the incidence of radiation on said sensing means above said threshold level said first switch path opens, thereby to isolate said second power supply line from said first power supply line; and thereafter said second switch path closes, thereby to shunt to ground residual stored electrical energy in said second devices connected with said second power supply line.

5,010,322

HOUSING FOR A PROCESS CONTROLLER

John J. Fry; George R. Hall, II, both of Wickliffe, and Robert A. Smith, Mentor, all of Ohio, assignors to Gas Research Institute, Chicago, Ill.

Continuation-in-part of Ser. No. 84,689, Aug. 12, 1987. This application Dec. 21, 1988, Ser. No. 287,734
Int. Cl.[5] G09G *1/00*
U.S. Cl. 340—700 7 Claims



1. A housing for a process controller means in a system including a sensor assembly having at least one sensing means

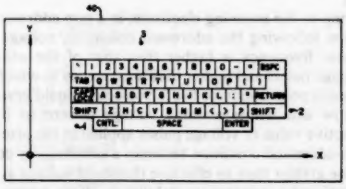
for providing an output signal indicative of a parameter of the process, the process controller means receiving and processing the output signal and generating control outputs for maintaining a desired operation of the process, said housing comprising: a body portion including a generally box-like member having top and bottom walls, a side wall, first and second end walls, and an open side, cover means pivotally mounted on said member adjacent said open side and movable between an open position and a closed position, said cover means in its closed position overlying said open side to close said body portion, said body portion defining means for mounting said process controller means within said member and means for mounting connection means within said member, said connection means constructed and arranged for connecting said process controller means to said sensor assembly, said member defining flange means extending along the periphery of its open side, and when said cover means is in its closed position, said cover means having a first portion extending in overlying relation with said flange means defining a first gap, and a second portion in overlying relation with portions of said top, bottom and side walls defining a second gap which extends perpendicular to said first gap, the ratio of the length of the overlapping portions of said member and said cover means to the width of one of said gaps therebetween being in the range of about 15:1 to 20:1 and the ratio of the length of the overlapping portions of said member and said cover means to the width of the other of said gaps being in the range of about 5:1 to about 10:1, thereby defining a closed housing which substantially attenuates electromagnetic radio frequency interference thereby isolating said process controller means therefrom whenever said cover means is in its closed position.

5,010,323

INTERACTIVE OVERLAY DRIVEN COMPUTER DISPLAY SYSTEM

Clifford J. Hoffman, 120 Spirea Dr., Dayton, Ohio 45419

Filed May 9, 1988, Ser. No. 191,379
Int. Cl.[5] G09G *5/00*
U.S. Cl. 340—706 **21 Claims**



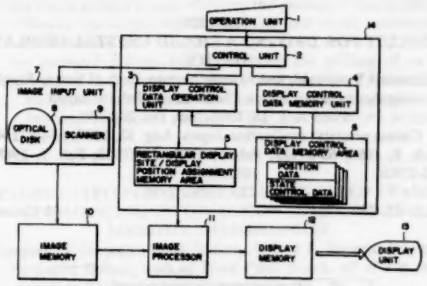
1. An overlay driven stored file display system comprising:
(a) a tablet and stylus means for providing a coordinate signal representative of the coordinates of any of a plurality of points on the tablet selected by the position of said stylus on said tablet;
(b) storing means for addressably storing a plurality of files each at a unique file address;
(c) an overlay for random placement on said tablet, said overlay having positioned thereon at least three points having a unique angular relationship defining a file address;
(d) means responsive to the coordinate signals generated when said stylus is sequentially positioned at each of said three points on said overlay for translating and normalizing the coordinates of the file address of the overlay to an overlay management space such that the file address of said overlay, corresponding to a unique file address of said storing means, causes an access of said storing means to retrieve a stored file; and
(e) means for displaying the retrieved file.

5,010,324

SEQUENTIAL PAGE UNIT IMAGE DISPLAY DEVICE HAVING DISPLAY CONTROL MEMORY

Hikari Yamamoto, Kanagawa, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 16, 1988, Ser. No. 245,210
Claims priority, application Japan, Sep. 16, 1987, 62-231716
Int. Cl.[5] G09G *5/00*
U.S. Cl. 340—723 **7 Claims**



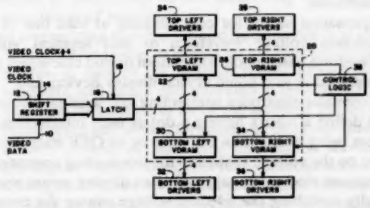
1. An image display device, comprising:
an operation input means for receiving an operator's instruction;
a display means for displaying image data of a page unit;
a display control data generator means for generating display control data for controlling a display state and a display position by enlarging, reducing, rotating or scrolling the image data of a page unit in accordance with an operator's instruction;
a display control data memory means for storing display control data of a display state position and a display state generated by said display control data generating means; and
a display control means for controlling a display state of image data of a next page by using the display control data stored in said display control data memory means in accordance with an instruction input by an operator.

5,010,325

DRIVING NETWORK FOR TFEL PANEL EMPLOYING A VIDEO FRAME BUFFER

Michael J. Ziuchkovski, Portland, Oreg., assignor to Planar Systems, Inc., Beaverton, Oreg.

Filed Dec. 19, 1988, Ser. No. 286,231
Int. Cl.[5] G09G *3/30*
U.S. Cl. 340—781 **5 Claims**



1. A driving network for an AC TFEL panel including orthoganally disposed sets of scanning and data electrodes sandwiching an electroluminescent laminar structure comprising:
(a) n independently driven sets of data electrodes;
(b) a buffer memory for each of said sets for storing video data;

(c) clock means for storing said video data in said buffer memories at a rate of m bits per clock pulse where the frequency of said clock means is f_1:

(d) data output means for asynchronously extracting said video data from said buffer memories at a second clock frequency, f_2, wherein m×n bits are extracted from the buffer memories per clock pulse wherein f_2 is less than F_1 and wherein m×n f_2 is greater than mf_1.

5,010,326

CIRCUIT FOR DRIVING A LIQUID CRYSTAL DISPLAY DEVICE

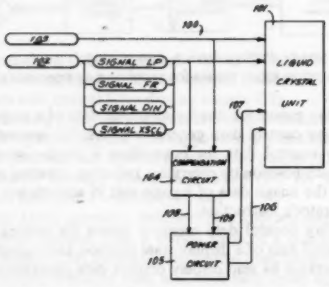
Katsunori Yamazaki, and Mitsuo Nagato, both of Suwa, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan

Filed Aug. 15, 1988, Ser. No. 232,750

Claims priority, application Japan, Aug. 13, 1987, 62-202154; Feb. 9, 1988, 63-27922; Feb. 9, 1988, 63-27923; Feb. 9, 1988, 63-27924

Int. Cl.[5] G09G 3/36

U.S. Cl. 340—784 **41 Claims**



1. A matrix liquid crystal display device for displaying characters or a pattern comprising:

a first substrate;

a plurality of common electrodes being formed on said first substrate;

a second substrate;

a plurality of segment electrodes being formed on said second substrate;

a liquid crystal layer sandwiched between said first substrate and said second substrate;

multiplex driving means for providing a common voltage waveform including a selected voltage or a non-selected voltage to said plurality of common electrodes and providing a segment voltage waveform including an ON voltage or an OFF voltage to said plurality of segment electrodes;

compensation means for compensating at least one of said common voltage waveform or said segment voltage waveform based upon said pattern or said characters to be displayed in said liquid crystal display device; and

said common electrodes intersecting said segment electrodes to define a matrix having a dot at each intersection, the dots being in either an ON state or an OFF state depending on the voltage applied to the intersecting common and segment electrodes, said multiplex driving means sequentially switching the selected voltage among the common electrodes, the compensation means receiving a data signal representative of the characters or pattern to be displayed, and producing a sign signal and strength signal, said multiplex driving means providing a common voltage waveform or a segment voltage waveform in which at least one portion of each waveform changes in a direction and size based on the sign signal and the strength signal.

5,010,327

METHOD OF DRIVING A LIQUID CRYSTAL MATRIX PANEL

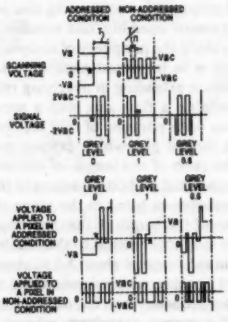
Naohide Wakita, Kobe; Tsuyoshi Uemura, Higashiosaka; Hiroyuki Ohnishi, Ikeda; Noriko Ohba, Nara; Isao Ota, Osaka, and Shingo Fujita, Katano, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Sep. 5, 1986, Ser. No. 903,773

Claims priority, application Japan, Sep. 6, 1985, 60-198010; Sep. 6, 1985, 60-198012; May 9, 1986, 61-107003

Int. Cl.[5] G09G 3/36

U.S. Cl. 340—784 **9 Claims**



1. A method of driving a liquid crystal matrix panel where a ferroelectric liquid crystal having negative dielectric anisotropy is held between scanning electrodes and signal electrodes crossing the scanning electrodes to form a matrix of pixels at crossing positions of the scanning and signal electrodes, comprising the steps of:

applying signal voltage pulses to a signal electrode and addressing voltage pulses to a scanning electrode in an addressed condition so as to make an addressed pixel at the crossing position of the signal electrode and the scanning electrode to be a desired molecular orientation state; and

applying to the scanning electrode, in a non-addressed condition following the addressed condition, voltage pulses whose frequency is higher than that of the addressing voltage pulses and higher than a frequency in which spontaneous polarization of the ferroelectric liquid crystal can follow and whose average voltage is zero so that the effective value of voltage pulses applied to the pixel in the non-addressed condition becomes a substantially constant value greater than an effective threshold voltage at which a molecular orientation stabilizing effect begins to be produced by the dielectric anisotropy, whereby the state of the pixel made in the addressed condition is held in the non-addressed condition until a next addressed condition.

5,010,328

DISPLAY DEVICE

Christopher J. Morris, Feltham; Ian Coulson, Maidenhead, and Paul W. H. Surguy, Uxbridge, all of England, assignors to Thorn EMI plc, London, England

Filed Jul. 18, 1988, Ser. No. 220,316

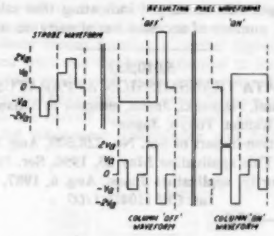
Claims priority, application United Kingdom, Jul. 21, 1987, 8717172; Aug. 3, 1987, 8718351

Int. Cl.[5] G09G 3/00

U.S. Cl. 340—784 **18 Claims**

1. A method of addressing a matrix-array type liquid crystal cell with a ferroelectric liquid crystal layer having a plurality of pixels defined by areas of overlap between members of a first set of electrodes on one side of the liquid crystal layer and members of a second set of electrodes on the other side of the liquid crystal layer, each of said pixels having a first and a

second optically distinguishable state, and having a response time for switching between said first and said second states which depends on the potential difference across the liquid crystal layer, the method including the step of applying a switching pixel waveform to a selected pixel to switch said selected pixel between said first and second states wherein said switching pixel waveform is charge-balanced and comprises a switching pulse having a pulse width and pulse height magni-



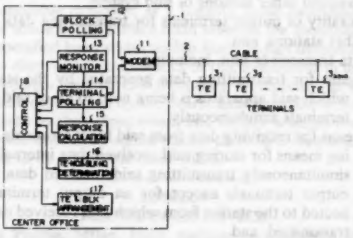
tude which, in combination, switch said selected pixel and another pulse, contributing to charge balancing, having a pulse height magnitude greater than the pulse height magnitude of said switching pulse and a pulse width which is less than that of the switching pulse and which, in combination with the pulse height magnitude thereof, is insufficient to switch said selected pixel, thereby to enable charge balanced addressing of said pixel with a waveform having a duration less than twice that of the switching pulse.

5,010,329

BLOCK POLLING DATA COMMUNICATION SYSTEM HAVING OPTIMUM BLOCK DETERMINATION MEANS

Kaoru Nagakura, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 180,320, Apr. 11, 1988, abandoned. This application Aug. 2, 1990, Ser. No. 562,412
Claims priority, application Japan, Apr. 10, 1987, 62-88507
Int. Cl.[5] G05B *23/02*
U.S. Cl. 340—825.080 **27 Claims**



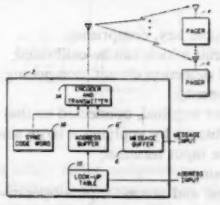
1. A block polling data communication system, comprising:
a center office;
a plurality of terminals, divided into a plurality of terminal blocks, each including at least one terminal; and
a cable connecting the center office and the terminals,
said center office including
block polling means for performing operations polling the terminal blocks,
response monitor means, operatively connected to the block polling means to cooperate therewith, for detecting and storing a request signal for a data transfer for a terminal in the terminal block of which the polling is effected,
terminal polling means, operatively connected to the response monitor means, for performing operations sequentially polling all of the terminals in each terminal block in which at least one terminal responded to the polling and issued the request for the data transfer, and
terminal and block rearrangement means for obtaining an average frequency of occurrences of requests from all of said terminals by counting a number of requests received in said center office from among all of said terminals and dividing by a number of times each of said terminals was polled, determining an optimum number of terminal blocks based on the average frequency so that a total polling time for the operations by said block polling means and said terminal polling means is minimized, and allocating said terminals into said optimum number of terminal blocks,
the block polling means effecting the polling of the terminal blocks rearranged by the terminal and block rearrangement means, and
the terminal polling means effecting the polling of each terminal in the terminal blocks determined at the terminal and block rearrangement means in which at least one terminal responded to the polling from the block polling means.

5,010,330

PAGING SYSTEM EMPLOYING DESIGNATED FRAME COMMENCING INFORMATION SERVICE DATA MESSAGE TRANSMISSION

Gregory O. Snowden, Boca Raton; Clifford E. Barrett, III, and Fernando Gomez, both of West Palm Beach, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 26, 1989, Ser. No. 456,423
Int. Cl.[5] H04B *7/00*
U.S. Cl. 340—825.21 **33 Claims**



1. A system for selective radio communication of call information from a transmitting terminal to a population of selectively addressable receivers, said transmitting terminal being operative to transmit said information periodically in transmission periods comprising a plurality of batches, each batch commencing with a predetermined synchronization code followed by a predetermined plurality of sequential frames which may include an individual selective call address of a receiver followed by an individual or group data message for said addressed receiver, each receiver being assigned one frame of each transmission batch, and operative to search for its individual selective call address in said assigned frame in each transmission batch and, when addressed, to receive the associated data message in subsequent frames, said system comprising:
a subset of information service subscribing receivers of said population of receivers;
said transmitting terminal for also transmitting in at least one batch of a transmission period an information service call address in each of the assigned frames of said subset of receivers, and, when said information service call address has been transmitted in all of the assigned frames of said receivers of said subset, for transmitting, in the same transmission period, an associated information service data message in frames subsequent the synchronization code of a designated batch subsequent said at least one batch; and
each said receiver of said subset being programmed to search each batch of a transmission period, for said information service call address solely in its assigned frame and, when addressed by said information service call address, to receive the associated information service data message in frames subsequent the synchronization code of said designated subsequent batch of the same transmission period.

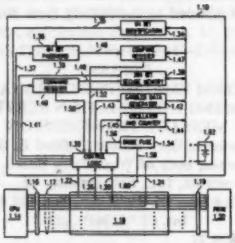
5,010,331
TIME-KEY INTEGRATED CIRCUIT

Donald R. Dias, Carrollton; Robert D. Lee, Denton; Michael L. Bolan, Dallas, and Francis A. Scherpenberg, Carrollton, all of Tex., assignors to Dallas Semiconductor Corporation, Dallas, Tex.

Continuation-in-part of Ser. No. 163,082, Mar. 2, 1988, Pat. No. 4,935,645, and a continuation-in-part of Ser. No. 163,279, Mar. 2, 1988, Pat. No. 4,897,860, and a continuation-in-part of Ser. No. 412,767, Sep. 26, 1989, Pat. No. 4,943,804, which is a continuation of Ser. No. 163,281, Mar. 2, 1988, Pat. No. 4,870,401, and a continuation of Ser. No. 163,280, Mar. 2, 1988, and a continuation of Ser. No. 273,698, Nov. 21, 1988. This application Nov. 14, 1989, Ser. No. 437,012

Int. Cl.[5] H04Q *1/00*; H01H *47/00*

U.S. Cl. 340—825.310 **1 Claim**



1. An electronic key, comprising:

a timing circuit which can be calibrated;

a fusing and detection circuit, comprising:

a fuse element;

a fuse input terminal, connected so that said fuse element can be blown by applying a large abnormal voltage to said fuse input terminal;

a comparator,

having first and second inputs operatively connected to said fuse element in such relation that

said first input of said comparator receives a voltage which is dependent on the state of said fuse element

and said second input of said comparator receives a voltage which is not substantially dependent on the state of said fuse element,

wherein said comparator compares said first and second inputs and provides a logic output which, in a first state, indicates that said fuse element has not been blown, and, in a second state, indicates that said fuse element has been blown;

wherein said fuse input terminal is operatively connected to said inputs of said comparator in such relation that any large abnormal voltage which is applied to said fuse input terminal will tend to drive the output of said comparator into said second state;

wherein said output of said comparator is connected to said timing circuit so that said second output state of said comparator prevents calibration of said timing circuit;

a counter, connected to count accesses to said electronic key;

control logic including a latch which can be set by receipt of a predetermined external command, said control logic being configured so that

at least some commands are accepted before said fuse element has been blown but are not accepted after said fuse element is blown;

at least some other commands are accepted after said fuse element has been blown and before said latch has been set, but are not accepted after said latch has been set; and

at least some other commands are accepted after said latch has been set and before said counter counts off a predetermined number of accesses, but are not accepted after said counter has counted said predetermined number of accesses;

wherein said latch cannot be reset after said fuse element has been blown;

and wherein said control logic and said counter are configured so that, if power is restored after said fuse element has already been blown, said counter will immediately provide an output indicating that said predetermined number of accesses has already occurred.

5,010,332
DATA TRANSMISSION APPARATUS

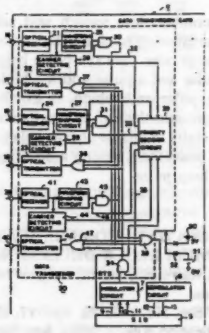
Noritaka Egami, Nagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 228,509, Aug. 5, 1988, abandoned. This application May 25, 1990, Ser. No. 528,287

Claims priority, application Japan, Aug. 6, 1987, 62-195181

Int. Cl.[5] H04Q *1/00*

U.S. Cl. 340—825.5 **5 Claims**



1. A data transmission apparatus for use in each of a plurality of stations of a communication system, comprising:

a plurality of input terminals for receiving data from predetermined other stations of said system;

a plurality of output terminals for transmitting data to said other stations; and

a data transceiver unit, including

means for transmitting data generated by the station in which said apparatus is being used to all of said output terminals simultaneously,

means for receiving data from said input terminals including means for storing said received data internally, and simultaneously transmitting said received data to said output terminals except for an output terminal connected to the station from which said received data was transmitted, and

priority decision means for detecting data received at said input terminals and enabling said means for receiving to store and simultaneously transmit only the earliest received data.

5,010,333
ADVANCED DIGITAL TELEMETRY SYSTEM FOR MONOCABLE TRANSMISSION FEATURING MULTILEVEL CORRELATIVE CODING AND ADAPTIVE TRANSVERSAL FILTER EQUALIZER

Wallace R. Gardner, Houston; Kenneth R. Goodman; Robert D. Puckett, both of LaPorte, and Ricky L. Draehn, Houston, all of Tex., assignors to Halliburton Logging Services, Inc., Houston, Tex.

Filed May 17, 1989, Ser. No. 353,278

Int. Cl.[5] G01V *1/00*

U.S. Cl. 340—856 **24 Claims**

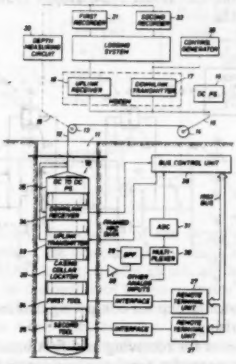
1. A telemetry system for use in transfer of a data system from a sonde in a well borehole to the surface via an armored

monocable having defined electrical characteristics of impedance, capacitance and inductance and the system includes a sonde supported uplink transmitter, comprising:

(a) a bus control unit in a sonde having an input data bus for receiving data from at least on tool supported inn the sonde wherein the tool data is required at the surface;

(b) means connected to said bus control unit for receiving a flow of data therefrom, said means encoding the data to form a duobinary encoded stream of data symbols wherein each data symbol represents an input data state and also correlates to another data state;

(c) modulator means forming a carrier signal, said means provided with said duobinary symbol to form an output data stream modulated on the carrier signal wherein the carrier signal has a specified carrier frequency, and further wherein the carrier signal is centered at a specified and width for subsequent transmission and further wherein



each data symbol is encoded with a positive carrier peak value and each symbol is also encoded with a negative and adjacent carrier peak;

(d) output driver means provided with the modulated carrier signal and having an analog output connected to the monocable deployed as a logging cable extending from the sonde to the surface andd wherein the monocable has a specified band width within limits in part determined by the electrical characteristics of t he monocable in use; and

(e) wherein said carrier frequency is centered in a band width determined by the characteristics of the monocable driven by the output means and further wherein the modulated duobinary signal placed thereon is frequency limited to fit within the band width.

5,010,334

TRANSDUCER DEVICE

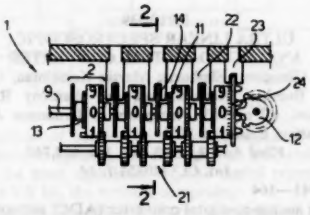
Vittorio Ponzio, Milan, Italy, assignor to Fabbriche Riunite Misuratori Sacofgas S.p.A., Milan, Italy

Filed Jan. 17, 1989, Ser. No. 297,434

Claims priority, application Italy, Jan. 18, 1988, 19101 A/88

Int. Cl.[5] G06M *1/22, 1/27*

U.S. Cl. 340—870.28 **17 Claims**



1. A transducer device comprising at least one pair of coded revolving metric indicators each comprising a metric drum and a revolving coded element, wherein said metric drums and said revolving coded elements are mounted for rotation on a common shaft, and wherein said coded revolving elements are each positioned out of phase ahead at a predetermined angle with respect to a preceding coded revolving element, said device further comprising a remote display device, a reading device generating signals indicative of rotary position of a said metric drum, and electronic processing means for preventing a signal from being sent to said display device when said signal has a value representing an amount lower than that of any signal previously sent.

5,010,335

OPTICAL PORT MULTIPLEXER FOR ELECTRIC METERING EQUIPMENT

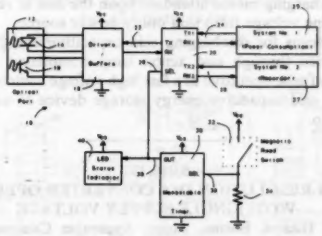
Richard Coppola, Norcross, and Farrokh Khandaghabadi, Lawrenceville, both of Ga., assignors to Schlumberger Industries, Inc., Norcross, Ga.

Continuation of Ser. No. 277,164, Nov. 29, 1988, abandoned.

This application May 21, 1990, Ser. No. 527,684

Int. Cl.[5] G08B *17/00;* **G01R** *13/04*

U.S. Cl. 340—870.28 **10 Claims**



1. An improved utility meter comprising:

(a) at least two electronic systems each of which comprises an independent source of data within the meter, each of said electronic systems further including data lines for communicating said data from each of said electronic systems to a retriever device;

(b) an optical port for transferring data from a selected one of said electronic systems to said retriever device, said optical port having data lines which can be connected to said data lines of said electronic systems;

(c) a multiplexer circuit within the meter and electrically connected between said optical port and said electronic systems for selectively connecting said data lines of one of said electronic systems to said data lines of said optical port; and

(d) a magnetic reed switch positioned within said utility meter proximate to a glass cover for switching said multiplexer circuit in response to noninvasive presence of a reed switch actuating means outside said glass cover within the operative proximity of said magnetic reed switch, said reed switch actuating means being independent of said retriever device, whereby said data lines of said selected one of said electronic systems are selectively connected to said data lines of said optical port.

5,010,336

TEMPORARY TRAFFIC LIGHT CONTROL

John L. Mosele, Northfield, and Lars O. Stolpe, Evanston, both of Ill., assignors to Jelp, Inc., Northfield, Ill.

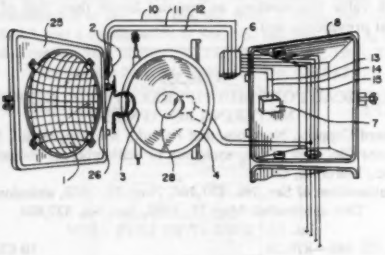
Filed Aug. 1, 1989, Ser. No. 388,244

Int. Cl.[5] G08G *1/95, 1/97*

U.S. Cl. 340—907 **15 Claims**

1. For use in a conventional traffic signaling device comprising a series of lights sequentially energized from a conventional utility power source, means for supplanting said traffic signal-

ing device upon failure of said utility power source comprising an independently powered lgiht source mounted within said signaling device including a xenon flash lamp, means for exciting said lamp comprising a capacitive energy storage device including a battery, a battery charging device, trigger means for discharging said capacitive energy storage device through said xenon flash lamp upon said capacitive energy storage device becoming sufficiently charged, a voltage sensor provid-



ing means for controlling the energization of an energy storage device charging means attendant upon the loss of resumption of full line voltage from said utility power source,

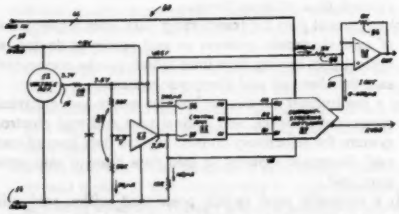
and means for discharging said capacitive energy storage device through said xenon lamp comprising an argon filled tube operative as a fast high voltage switch connecting said capacitive energy storage device to said xenon lamp.

5,010,337

HIGH RESOLUTION D/A CONVERTER OPERABLE WITH SINGLE SUPPLY VOLTAGE

Shinichi Hisano, Boston, Mass.; Apparajan Ganesan, Salem, N.H., and Thomas S. Guy, Andover, Mass., assignors to Analog Devices, Incorporated, Norwood, Mass.

Filed Mar. 15, 1990, Ser. No. 493,997
Int. Cl.[5] H03M *1/78*
U.S. Cl. 341—154 **8 Claims**



1. A high-resolution D/A converter integrated on an IC chip and operable with a relatively low single-supply voltage, said converter comprising:

a current-steering network having a plurality of matched current-source cells each comprising a bipolar current-source transistor;

means responsive to a multi-bit input signal for turning said current-source cells on or off, with the resultant current being steered to an output line;

resistor means connected to said current-source cells and including an R/2R network for at least a selected group thereof;

a voltage reference to be powered by said single supply voltage and operable to produce a stable reference voltage on an output line;

a control amplifier receiving a voltage corresponding to said reference voltage and arranged to produce a control signal;

means connecting said control signal to said current-source cells to set the level of the currents therefrom;

an output operational amplifier having first and second input terminals;

means supplying to said first input terminal a voltage proportional to said corresponding voltage; and

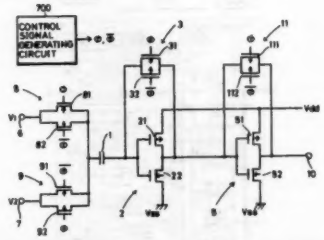
means coupling said second input terminal to a signal derived from the output of said current-steering network.

5,010,338

COMPARATOR CIRCUIT AND ANALOG TO DIGITAL CONVERTER

Takahiro Miki, and Shiro Hosotani, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 18, 1988, Ser. No. 260,126
Claims priority, application Japan, Oct. 19, 1987, 62-264159
Int. Cl.[5] H03K *5/24;* H03M *1/36*
U.S. Cl. 341—159 **13 Claims**



1. A comparator circuit for comparing first and second input voltages comprising:

first input means for receiving said first input voltage;

second input means for receiving said second input voltage;

capacitor means having first and second electrodes;

first switching means connected between said first input means and said first electrode of said capacitor means;

second switching means connected between said second input means and said first electrode of said capacitor means;

first inverter means having an input connected to said second electrode of said capacitor means;

third switching means connected across said first inverter means;

second inverter means having an input conductively connected to the output of said first inverter means;

fourth switching means connected across said second inverter means;

timing control means connected to said first, second, third and fourth switching means for controlling the switching operations thereof such that said first, third and fourth switching means are turned on whereas said second switching means is turned off at a first timing, and said first, third and fourth switching means are turned off whereas said second switching means is turned on at a second timing later than said first timing.

5,010,339

ULTRA LINEAR SPECTROSCOPIC ANALOG-TO-DIGITAL CONVERTER

David A. Giangano, Elmhurst; Martin Kesselman, Commack; Steven Bocskor, Ronkonkoma, and Anthony R. Celona, Northport, all of N.Y., assignors to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Apr. 2, 1990, Ser. No. 502,746
Int. Cl.[5] H03M *1/34*
U.S. Cl. 341—164 **9 Claims**

1. In an analog-to-digital converter (ADC) network having means for generating a variable analog count for summing with

an analog input signal, the result of which is converted to a digital number by an ADC, the variable count being subtracted thereafter for a final digital output, the improvement comprising:

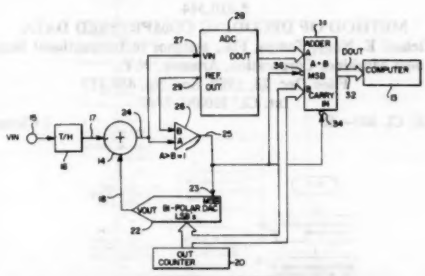
bi-polar digital-to-analog converter (DAC) means connected between a digital number generator which generates the variable count and a first input of a summing means;

means for sampling the input signal;

means for connecting the sampled input signal to a second input of the summing means;

a comparator;

means connecting a full scale reference voltage of the ADC to a first input of the comparator;



means connecting the output of the summing means to a second input of the comparator to obtain a comparison;

the bi-polar DAC having a most significant bit (MSB) input connected to the output of the comparator for setting the MSB of the DAC when the comparison indicates the full scale of the ADC is exceeded;

wherein first and second inputs of the summing means are subtracted thereby producing a comparator input within range for the ADC; and

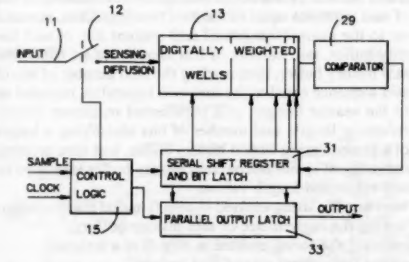
means connected to the output of the ADC and the number generator for separating the variable count from the output of the DAC thereby reconstructing the digitally converted analog input signal.

5,010,340

CHARGE DOMAIN SUCCESSIVE APPROXIMATION ANALOG TO DIGITAL CONVERTER

Paul E. Green, La Mirada, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Mar. 26, 1990, Ser. No. 498,788
Int. Cl.[5] H03M *1/38*
U.S. Cl. 341—172 **18 Claims**



1. A method of converting an analog signal to a digital representation comprising first through Nth bits, with the first bit being the most significant bit, the digital representation including a kth bit, the method comprising:

(a) setting first through Nth charge storage gates, including a kth gate, in a charge accept mode, wherein each of said charge storage gates has a charge accept mode and a charge expel mode.,

(b) receiving a charge packet representative of a signal amplitude;

(c) storing said charge packet proportionately in said gates;

(d) setting said kth gate in the charge expel mode and expelling the charge from said kth gate onto a sensing diffusion connected to said gates and onto others of said gates;

(e) detecting whether said sensing diffusion is in a first condition or a second condition;

(f) if said sensing diffusion is in said first condition, recording a "0" for the kth bit of said digital representation, and holding said kth gate in said charge expel mode; and

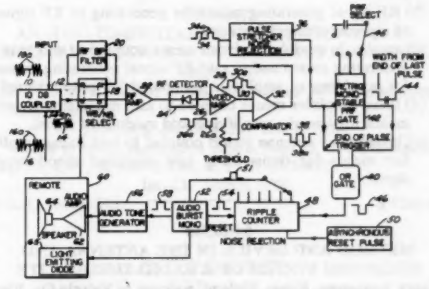
(g) if said sensing diffusion is in said second condition, recording a "1" for the kth bit of said digital representation and resetting said kth gate to said charge accept mode.

5,010,341

HIGH PULSE REPETITION FREQUENCY RADAR EARLY WARNING RECEIVER

William P. Huntley, Old Lyme, and David J. Swanick, Salem, both of Conn., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 4, 1989, Ser. No. 417,616
Int. Cl.[5] G01S *13/04*
U.S. Cl. 342—20 **5 Claims**



1. A high pulse repetition frequency radar early warning receiver comprising:

coupler means for receiving an input signal and transmitting an attenuated version of said input signal;

wideband/narrow band select switch means connected for receiving said attenuated signal, selecting a portion of said attenuated signal and transmitting said selected portion of said attenuated signal;

RF detector means connected to receive said selected portion of said signal, amplitude detecting said selected portion of said signal, and transmitting the amplitude detected signal;

comparator means connected to said RF detector for receiving said amplitude detected signal and for generating digital pulses when said amplitude detected signal exceeds a predetermined magnitude;

pulse stretching means connected to said comparator for receiving said digital pulses, lengthening the time frame of the received pulses, and transmitting the lengthened pulses;

pulse repetition frequency determining circuit means connected to said pulse stretcher for receiving said lengthened pulses and for generating output pulses when the frequency of the lengthened pulses exceeds a predetermined frequency;

counting circuit means connected to said pulse repetition frequency determining circuit means for receiving said generated output pulses and for generating an output signal when the number of received pulses exceeds a

predetermined value within a predetermined period of time; and

signal means connected to said counting circuit for receiving said generated output signal and for generating at least one of an audio and visual signal upon receipt of said generated output signal.

5,010,342

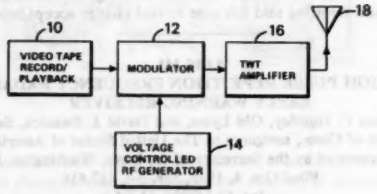
RADAR SIMULATOR

James R. Jones, Jr., 2944 Renault Pl., San Diego, Calif. 92122

Filed May 14, 1973, Ser. No. 365,303

Int. Cl.[5] G01S *7/40*; G09B *9/00*

U.S. Cl. 342—169 **7 Claims**



1. A radar signature simulator comprising:

(a) means for generating the video portion of a radar signature,

(b) RF signal generating means for generating an RF signal of a predetermined frequency,

(c) amplitude modulator circuit means coupled to said video generating means and to said RF signal generating means for providing an amplitude modulated RF output signal,

(d) linear amplifier means coupled to said modulator circuit means for linearly amplifying said modulated signal,

(e) broad-band antenna means coupled to said linear amplifier means for transmitting said amplified dmodulated signal.

5,010,343

METHOD AND DEVICE IN THE ANTENNA AND RECEIVING SYSTEM OF A RADIO THEODOLITE

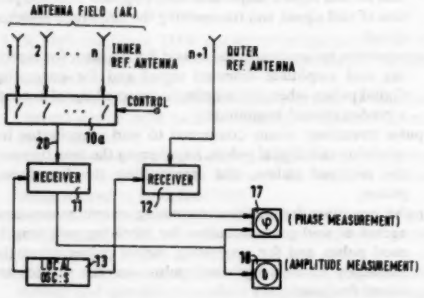
Henry Andersson, Espoo, Finland, assignor to Vaisala Oy, Finland

Filed Apr. 25, 1989, Ser. No. 352,836

Claims priority, application Finland, Apr. 26, 1988, 881956

Int. Cl.[5] G01S *5/04*

U.S. Cl. 342—432 **4 Claims**



1. Radio theodolite apparatus for measuring a radio signal arriving from a transmitter comprising:

an antenna system including at least three antennas (1 . . . n−1), in an antenna field (AK), which includes an inner reference antenna (n) as well as an antenna selection unit (**10***a*), receiver devices (**11**), phase-measurement devices (**17**), amplitude-measurement devices, and control and measurement device(**60**);

a reference antenna (n+1) not belonging to the antenna field (AK) and a related receiver device (**12**) connected to the antenna system, whereby the phases of the signals of all the antennas (1 . . . n) belonging to the antenna field can be measured in relation to the reference signal obtained into said receiver device (**12**); and

the outer reference antenna (n+1) is placed at a distance larger than two wavelengths (A) from the nearest other antenna (1 . . . n).

5,010,344

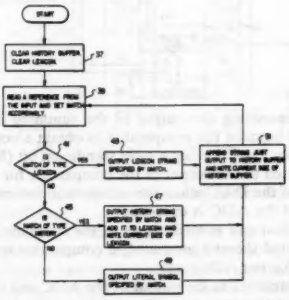
METHOD OF DECODING COMPRESSED DATA

Michael E. Nagy, Tampa, Fla., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 28, 1989, Ser. No. 458,117

Int. Cl.[5] H03M *7/40*

U.S. Cl. 341—65 **2 Claims**



2. A method of decoding a compressed free-form data stream made up of a sequence of literal references, lexicon references and history references, which comprises the steps of:

a) reading the first bit of said sequence;

b) reading the next eight bits of said sequence and emitting the symbol represented by said eight bits if said first bit is a zero;

c) inserting the symbol emitted in step b) in a history buffer;

d) noting the current size of said history buffer;

e) reading the second bit of said sequence if said first bit is a one;

f) if said second bit is a zero, reading the next number of bits of said sequence equal to the base two logarithm, rounded up to the nearest integer, of said current size of said history buffer, said number of bits identifying an offset into said history buffer, then reading the next number of bits of said sequence equal to the base two logarithm, rounded up to the nearest integer, of a preselected maximum history reference length, said number of bits identifying a length of a symbol string in said history buffer, and then emitting the string of symbols from said history buffer identified by said offset and length values;

g) inserting the string emitted in step f) in said history buffer;

h) noting the current size of said history buffer;

i) inserting the string emitted in step f) in a lexicon;

j) noting the current size of said lexicon;

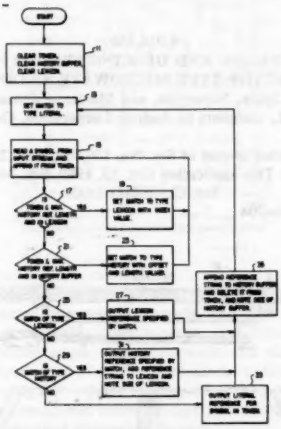
k) if said second bit is a one, reading the next number of bits from said sequence equal to the base two logarithm, rounded up to the nearest integer, of said current size of said lexicon, said number of bits representing an index into said lexicon, and emitting the string of symbols from said lexicon identified by said index;

l) inserting the string emitted in step k) in said history buffer;
m) noting the current size of said history buffer; and
n) repeating steps a) through m) until said sequence is exhausted.

5,010,345
DATA COMPRESSION METHOD

Michael E. Nagy, Tampa, Fla., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 28, 1989, Ser. No. 458,119
Int. Cl.[5] H03M 7/40
U.S. Cl. 341—65 15 Claims

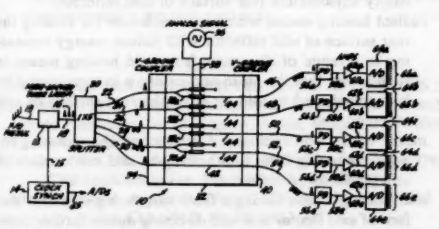


1. A method of compressing data made up of a sequence of symbols, which comprises the steps of:
recording in a fixed length history buffer symbols of said sequence;
emitting a history reference whenever a string of symbols from said sequence is duplicated in said history buffer;
recording in a lexicon strings of symbols that have been emitted by means of history references; and,
emitting a lexicon reference whenever a string of symbols from said sequence is duplicated in said lexicon.

5,010,346
ELECTRO-OPTICAL ANALOG-TO-DIGITAL CONVERTER AND METHOD FOR DIGITIZING AN ANALOG SIGNAL

Michael C. Hamilton, and John A. Bell, both of Redmond, Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Oct. 27, 1989, Ser. No. 427,730
Int. Cl.[5] H03M 1/00
U.S. Cl. 341—137 24 Claims

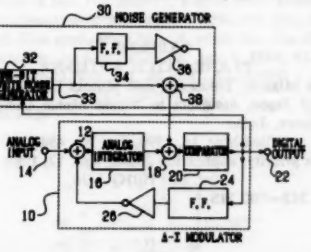


1. A high speed, electro-optical analog-to-digital converter, for digitizing an analog signal, comprising:
(a) clock means for producing synchronization signals;
(b) light source means, connected to receive the synchronization signals and operative to produce pulses of light in response thereto;
(c) modulator means for modulating an intensity of the pulses of light as a function of an amplitude of the analog signal and thereby producing modulated light pulses, light pulses entering the modulator means at successively different times being modulated in response to the amplitude of the analog signal at those different times;
(d) demultiplexing means, for demultiplexing the light pulses produced by the light source means;
(e) detector means, connected to receive light pulses that have been demultiplexed by the demultiplexing means and modulated by the modulating means, for producing electrical signals having a magnitude proportional to the intensity of said light pulses; and
(f) a plurality of electrical analog-to-digital converters, each connected to receive a different one of the electrical signals and to receive the synchronization signals produced by the clock means, for producing digital data that vary as a function of the magnitude of said electrical signals, said digital data produced thereby corresponding to the amplitude of the analog signal at the different times.

5,010,347
ANALOG-TO-DIGITAL CONVERTER HAVING AN EXCELLENT SIGNAL-TO-NOISE RATIO FOR SMALL SIGNALS

Akira Yukawa, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Sep. 26, 1988, Ser. No. 249,158
Claims priority, application Japan, Sep. 25, 1987, 62-24141; Sep. 25, 1987, 62-24142; Oct. 1, 1987, 62-249228
Int. Cl.[5] H03M 3/00
U.S. Cl. 341—143 8 Claims



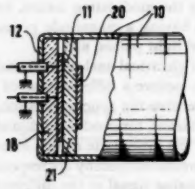
1. An oversampled analog-to-digital converter which includes an analog-to-digital converting circuit having at least an analog signal input terminal, an adder means having a first input connected to the analog signal input terminal and a second input, and a comparator having an input coupled to receive an output of the adder means and operating to generate a digital signal at a given sampling frequency, this digital signal being applied to the second input of the adder means, wherein the improvement comprises a noise generator including a one-bit white noise generator connected to receive the digital signal outputted from the comparator for generating a one-bit white noise signal, and means coupled to the one-bit white noise generator for outputting a signal indicative of a difference between values of two white noise signals at two continuous sampling points, this difference signal being added to the input of the comparator, wherein said digital signal is generated without subtracting said one-bit white noise signal therefrom.

5,010,348

DEVICE FOR EXCITING A WAVEGUIDE WITH CIRCULAR POLARIZATION FROM A PLANE ANTENNA

Didier Rene, Toulouse; Thierry Dusseux, Colombes, and Philippe Ginestet, Toulouse, all of France, assignors to Alcatel Espace, Courbevoie, France

Filed Nov. 7, 1988, Ser. No. 268,302
Claims priority, application France, Nov. 5, 1987, 87 15359
Int. Cl.[5] H01Q *1/38*
U.S. Cl. 343—700 MS **7 Claims**



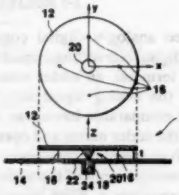
1. A device for exciting a rectinlinear hollow waveguide having an axis of symmetry and being closed at a first end perpendicular to said axis of symmetry; said device comprising: a plane antenna comprising a ground plane constituted by said first end of the waveguide; at least two dielectric layers, separated by a first metallic surface, and disposed on the interior surface of said waveguide first end; the dielectric layer of said layers remote from said waveguide first end having a second metallic surface disposed thereon, said dielectric layers and said metallic surfaces all being disposed symmetrically with respect to the axis of symmetry of the waveguide, and wherein said metallic surfaces each form a radiating element and constitute a plurality of superposed resonators disposed on the interior surface of said waveguide first end, at least one pair of coaxial lines connected to said first metallic surface, circumferentially spaced from each other by 90° relative to the axis of symmetry of the waveguide and a circuit including a hybrid coupler feeding said coaxial line in quadrature for exciting the waveguide with circular polarization.

5,010,349

PLANE PATCH ANTENNA

Tsuyoshi Mizuno, Yokosuka, and Motoki Hirano, Yokohama, both of Japan, assignors to Nissan Motor Company, Ltd., Yokohama, Japan

Filed Mar. 16, 1990, Ser. No. 494,343
Claims priority, application Japan, Apr. 12, 1989, 1-90681
Int. Cl.[5] H01Q *1/36*
U.S. Cl. 343—700 MS **6 Claims**



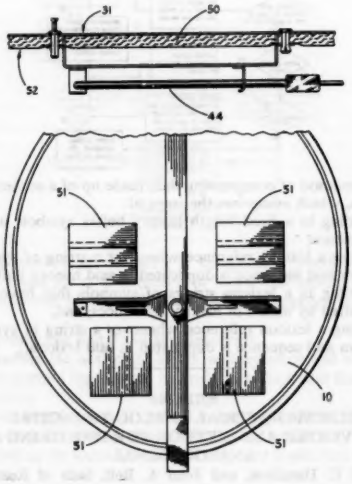
1. A plane patch antenna comprising:
a patch conductive plate member;
an earth conductive plate member;
a plurality of short pins extending between the patch and earth plane members to maintain the patch and earth plate members in spaced-parallel relation to each other and to make electric connection between the patch and earth plate members; and
a feeder shaft extending from the patch plate member for electrical connection of the patch plate member to a lead wire, the feeder shaft having a tapered portion extending from the patch plate member toward the earth plate member, the tapered portion having a cross-sectional area decreasing as going away from the patch plate member, the tapered portion having a maximum diameter in its area of attachment to the patch plate member, the maximum diameter being in a range of 0.12λ to 0.18λ.

5,010,350

ANTI-ICING AND DE-ICING SYSTEM FOR REFLECTOR-TYPE MICROWAVE ANTENNAS

Charles L. Lipkin, Naperville, and Marianne Jones, Lockport, both of Ill., assignors to Andrew Corporation, Orland Park, Ill.

Continuation-in-part of Ser. No. 130,809, Nov. 25, 1987, abandoned. This application Oct. 13, 1989, Ser. No. 421,173
Int. Cl.[5] H01Q *1/02*
U.S. Cl. 343—704 **11 Claims**



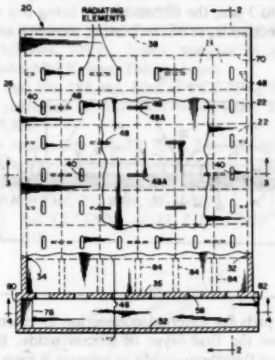
1. An anti-icing and de-icing system for a reflector-type microwave antenna having a paraboloidal reflector for launching and receiving microwave signals, said system comprising
a thermally non-conductive enclosure forming an enclosed cavity adjacent the rear surface of said reflector,
radiant heating means within said enclosure for heating the rear surface of said reflector with radiant energy emanating in a range of directions from said heating means in such a way that the air in said cavity is in turn heated by heat transferred to said air from the rear surface of said reflector, and
means within said enclosure for directing the radiating energy emanating from said heating to said rear surface of said paraboloidal reflector,
said heating means having a front side facing said rear surface of said flector and said directing means further comprising means for diverting at least a portion of the radiant energy emanating from said front side of said heating source and dispersed said diverted energy across the rear surface of said paraboloidal reflector.

5,010,351

SLOT RADIATOR ASSEMBLY WITH VANE TUNING

Kenneth C. Kelly, Sherman Oaks, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Feb. 8, 1990, Ser. No. 477,089
Int. Cl.[5] H01Q 13/10
U.S. Cl. 343—771 10 Claims



1. An array antenna, comprising:

a hollow waveguide of rectangular cross-section having first and second opposed broadwalls, and first and second opposed sidewalls, joined together along their respective longitudinal edges, said broadwalls and said sidewalls being comprised of conductive material to thereby render said waveguide capable of supporting the propagation of an electromagnetic wave through said waveguide, along the longitudinal dimension thereof;

a matrix of radiating slots provided in said first broadwall, said matrix being defined by a plurality M of rows of said slots, and a plurality N of columns of said slots, with each of said slots being oriented with its longitudinal dimension substantially parallel to the longitudinal dimension of said waveguide;

a plurality of vanes provided on said second broadwall and extending only partially across the internal height dimension of said waveguide, said vanes being configured with relation to each said column of slots in an alternating pattern such that successive ones of said vanes corresponding to successive rows of a column are located on opposite sides of said slots occupying said successive rows of that column;

wherein said vanes each lie in a plane disposed transverse to said sidewalls of said waveguide;

wherein the width of said broadwalls is at least N times greater than the height of said sidewalls; and,

wherein said vanes function to provide a sinuous path of propagation of said electromagnetic wave along each said column of slots so as to enhance coupling of said electromagnetic wave through said slots.

5,010,352

THERMAL TRANSFER INK PRINTING APPARATUS

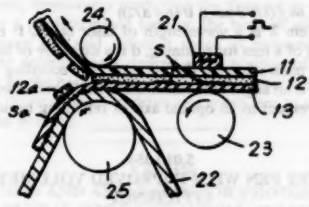
Katsumori Takei; Hitoshi Fukushima; Kohei Iwamoto, and Hiroto Nakamura, all of Nagano, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan

Division of Ser. No. 104,139, Oct. 5, 1987, Pat. No. 4,914,079.
This application Jan. 19, 1990, Ser. No. 467,114
Claims priority, application Japan, Oct. 6, 1986, 61-237482
Int. Cl.[5] G01D 15/10; B41J 2/315
U.S. Cl. 346—76 PH 6 Claims

1. A thermal transfer printing apparatus adapted for forming an image on a recording medium with a thermal transfer ink medium having at least a heat resistant support layer, a thermal ink layer thereon and an ink transfer layer on the ink layer, comprising:

a thermal print head for selectively applying thermal energy to the thermal transfer ink medium in a selected pattern corresponding to a desired image;

first platen means disposed opposite to the print head with the thermal transfer ink medium and not the recording medium therebetween for cooperating with the print head for contacting the thermal transfer ink medium to the print head for transferring the thermal energy from the



printing head to selectively heat the ink layer for transfer of selected portions of the ink layer to the ink transfer layer; and

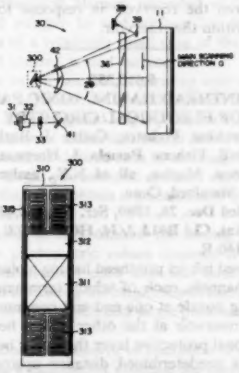
second platen means for contacting the ink transfer layer leaving a position between the print head and the first platen means to the recording medium and for separating the support layer and unselected ink portions from the ink transfer layer and selected ink portions and for adhering the ink transfer layer and selected ink portions to the recording medium.

5,010,353

LASER RECORDER WITH INTEGRALLY MOLDED DEFLECTOR

Takashi Murahashi; Toshihiko Nakazawa; Toshihiro Takesue, and Toshihiro Motoi, all of Hachioji, Japan, assignors to Konica Corporation, Tokyo, Japan

Continuation of Ser. No. 203,697, Jun. 7, 1988, abandoned, which is a continuation-in-part of Ser. No. 68,142, Jun. 29, 1987, abandoned. This application Mar. 1, 1990, Ser. No. 490,518
Claims priority, application Japan, Jul. 4, 1986, 61-158559; May 11, 1987, 62-113853; Jul. 20, 1987, 62-181659
Int. Cl.[5] H04N 1/21
U.S. Cl. 346—108 8 Claims



1. A laser recording apparatus comprising:

a deflector having a deflecting element for deflecting, in a predetermined direction, a laser beam modulated in accordance with image signals; and

a beam correcting lens system interposed between said deflector and a recording medium so that said laser beam, deflected by said deflector, scans said recording medium through said lens system to write in said image signal,

wherein said deflecting element is molded integrally of a frame, a reflecting mirror, a drive coil and a ligament, and said deflector is driven at or near a natural frequency of said deflecting element, and

a length D in the main scanning direction at a laser beam reflecting surface of said reflecting mirror is selected to comply with the following formula,

$$D \geq 1.64 \times (\lambda F/d \cos (i\ l/4F + \alpha/2))$$

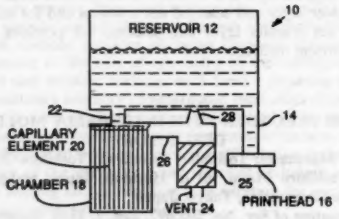
wherein λ is a wavelength of laser beam, F is a focal length of a lens for scanning, d is a diameter of laser beam in the main scanning direction on the recording medium, and α is an angle of incident beam to the reflecting mirror with respect to an optical axis of reflecting beam.

5,010,354

INK JET PEN WITH IMPROVED VOLUMETRIC EFFICIENCY

Bruce Cowger; John H. Dion, and William E. Peters, all of Corvallis, Oreg., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Nov. 28, 1989, Ser. No. 442,746
Int. Cl.[5] B41J *2/175*
U.S. Cl. 346—140 R **16 Claims**



1. An ink jet pen, comprising:

an ink reservoir for supplying ink to a printhead;

a chamber adjacent to the ink reservoir; and

capillary volume means contained within the chamber comprising a plurality of spaced plates, the capillary means being in fluid communication with the ink reservoir for maintaining pressure at the printhead at less than ambient pressure, the capillary means supplying ink to and accepting ink from the reservoir in response to a change in pressure within the reservoir.

5,010,355

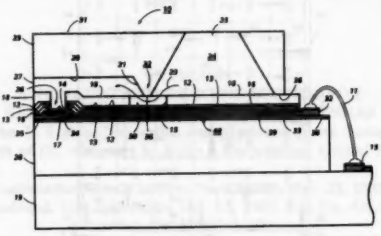
INK JET PRINTHEAD HAVING IONIC PASSIVATION OF ELECTRICAL CIRCUITRY

William G. Hawkins, Webster; Cathie J. Burke, Rochester; Daniel O. Roll, Fishers; Pamela J. Hartman, Hilton, and Diane Atkinson, Marion, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 26, 1989, Ser. No. 456,431
Int. Cl.[5] B41J *2/34*; H01L *21/00*
U.S. Cl. 346—140 R **6 Claims**

1. An improved ink jet printhead having a plurality of parallel ink flow channels, each of which terminate with an ink droplet emitting nozzle at one end and communicate with an ink supplying reservoir at the other end, a heating element with a cavitational protective layer thereover being located in each channel a predetermined distance upstream from the nozzle, and MOS electronic circuitry monolithically integrated within the printhead for applying electrical pulses to the heating elements to produce bubbles momentarily on the protective layer of the heating element in response thereto, each of said bubbles expelling an ink droplet from the nozzles, wherein the improvement comprises:

ionic passivation of the MOS electronic circuitry through the deposition of a multi-layered, thin film insulative coating thereon consisting of a first layer of doped or undoped silicon dioxide directly over the MOS electronic circuitry and heating elements with protective layer having a thickness of 200 Å to 2 μm followed by a second layer of plasma nitride over the first layer having a thickness of 1000 Å to 3 μm, the silicon nitride being dry etched over the protective layer of the heating elements and electrical



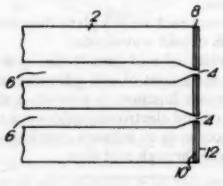
contact pads for external connection to electrical power to expose the first layer of silicon oxide, followed by etching of the silicon oxide to remove it from the protective layer and contact pads, whereby the etch sequence prevents both contact pads and the heating element protective layers from being attacked, and the MOS circuitry is concurrently protected from mobile ions in the ink by said multi-layered, ionic passivation, while maintaining the cost effective fabrication of a printhead having heating elements with a cavitational protective layer to enhance their life time.

5,010,356

METHOD OF FORMING AN ADHERENT FLUOROSILANE LAYER ON A SUBSTRATE AND INK JET RECORDING HEAD CONTAINING SUCH A LAYER

Rosemary B. Albinson, London, England, assignor to XAAR Limited, England

Filed Oct. 2, 1989, Ser. No. 415,726
Claims priority, application United Kingdom, Oct. 19, 1988, 8824436; Mar. 20, 1989, 8906380
Int. Cl.[5] G01D *15/18*; B05D *5/08, 7/24*
U.S. Cl. 346—140 R **38 Claims**



1. A method of reducing the wettability of a surface comprising plastic or non-vitreous inorganic material by providing an adherent coating of fluorosilane on said surface, said method comprising the steps of:

(a) forming on said surface an adherent first layer comprising cured siloxane; and

(b) applying to said first layer a second layer comprising at least one fluorosilane having a silicon atom to which is attached at least one hydrolyzable group and at least one fluorine-containing organic group which donates non-wetting properties to said second layer.

26. An ink jet recording head of the type in which ink droplets are jetted from a jet orifice of said head toward a recording

material, said head defining a surface surrounding said jet orifice comprising plastic or non-vitreous inorganic material coated with a fluorosilane layer which reduces the wettability of said surface, with a layer comprising cured siloxane which is adherent to said surface interposed between said surface and said fluorosilane layer, said fluorosilane layer being derived from at least one fluorosilane having at least one hydrolyzable group attached to a silicon atom.

5,010,357

CAMERA IMAGE PLANE SIZE CONTROL DEVICE

Masayuki Misawa, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

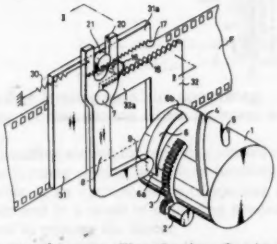
Division of Ser. No. 188,410, filed as PCT JP87/00649 on Sep. 1, 1987, published as WO88/01754 on Mar. 10, 1988, Pat. No. 4,987,436.

This application Jul. 19, 1989, Ser. No. 382,109

Claims priority, application Japan, Sep. 2, 1986, 61-134573; Sep. 25, 1986, 61-146871; Oct. 27, 1986, 61-164390; Oct. 27, 1986, 61-164391; Oct. 27, 1986, 61-164392

Int. Cl.[5] G03B *13/32, 1/18, 17/00*

U.S. Cl. 354—159 **66 Claims**



1. An apparatus for controlling the size of an image plane in a camera having a zoom lens, said zoom lens comprising means for displacing an exit pupil of the lens in accordance with a zooming operation of said lens, said apparatus comprising first and second movable aperture frames together forming an aperture which comprises means for defining the size of said image plane, said first and second movable aperture frames being movable in directions substantially parallel to the direction of movement of film which is travelling within said camera, said movable aperture frames being movable in response to movement of said exit pupil during a zooming operation, said movable aperture frames thereby comprising means for restricting the size of said image plane within predetermined limits.

5,010,358

PREDETERMINED MAGNIFICATION PHOTOGRAPHING APPARATUS FOR A CAMERA

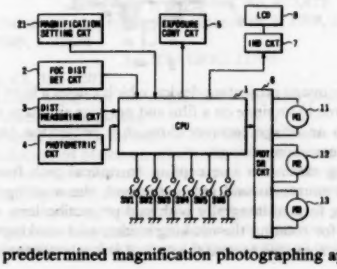
Hidenori Miyamoto, Kawasaki, Japan, assignor to Nikon Corporation, Tokyo, Japan

Filed Dec. 11, 1989, Ser. No. 448,322

Claims priority, application Japan, Dec. 13, 1988, 63-315778

Int. Cl.[5] G03B *3/00, 13/18, 1/18*

U.S. Cl. 354—402 **17 Claims**



1. A predetermined magnification photographing apparatus for a camera using a zoom lens for effecting zoom photographing at a predetermined photographing magnification comprising:

driving means for driving said zoom lens;

detecting means for detecting distance to an object moving along an optic axis of said zoom lens and speed of movement of said object;

output means for outputting an operation signal; and

control means for causing said detecting means to repetitively detect the distance to said object and the speed of movement of said object as long as said operation signal is output, repetitively predicting the distance to said object after a predetermined time on the basis of said detected distance and said detected speed of movement, repetitively determining a desired zoom position of said zoom lens on the basis of said predicted distance, and operating said driving means to drive said zoom lens to said desired zoom position.

5,010,359

METHOD AND APPARATUS FOR PHOTOMETRY FROM PLURAL POINTS OF AUTOMATIC EXPOSURE CAMERA

Yoshihisa Maitani, Hachioji, Japan, assignor to Olympus Optical Company Ltd., Japan

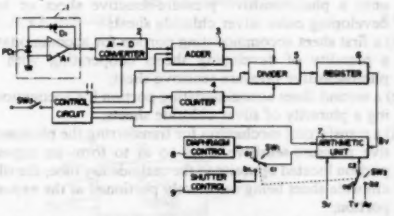
Continuation of Ser. No. 263,032, May 12, 1981, abandoned.

This application Mar. 14, 1983, Ser. No. 469,471

Claims priority, application Japan, Jul. 31, 1980, 55-105656

Int. Cl.[5] G03B *7/08, 7/091;* **H03K** *21/00;* **G06F** *7/52*

U.S. Cl. 354—410 **13 Claims**



1. An apparatus for an automatic exposure camera for effecting photometry of a plurality of small areas in the image field of an object being photographed, comprising:

a taking lens for focussing an image of the object being photographed upon a surface in said camera;

a single photometric element provided in the camera and positioned relative to said surface for determining the brightness of a relatively small area of the image field of the object created at said surface;

a viewfinder on the camera cooperating with said taking lens enabling the operator to view the image field;

a switch for activating said single photometric element upon each operation of the switch which is activated each time a predeterrmined desired area of an image field is aligned with said single photometric element through the aid of said viewfinder to obtain a photometric value at the selected small area;

memory means in said camera for storing a plurality of successive photometric values obtained from said single photometric element each time said switch is operated, said values indicating the brightness of said predetermined desired area with which said single photometric element is aligned;

calculation means responsive to operation of said switch for performing a calculation utilizing the plurality of photometric values stored in said stored means and the number of photometric values stored to derive a calculation value;

exposure control means responsive to values of film speed and either an aperture setting or a shutter speed setting

preset into said camera for controlling an exposure of said camera in accordance with said preset values and said calculation value, upon initiation of a photographing operation.

5,010,360

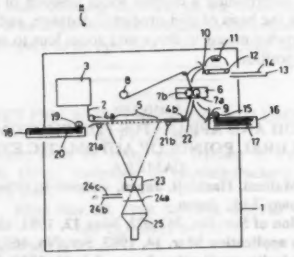
IMAGE FORMING APPARATUS

Takemi Yamamoto; Osamu Nagata; Ryohei Komiya; Jun Sakai, and Yoshiyuki Ban, all of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Sep. 27, 1990, Ser. No. 589,095

Int. Cl.[5] G03B *27/72*

U.S. Cl. 355—20 **5 Claims**



1. An image forming apparatus for forming an image on a sheet by using a cathode ray tube as a light source which comprises;

(a) a cathode ray tube for selectively emitting light signals onto a photosensitive pressure-sensitive sheet or heat-developing color silver chloride sheet;

(b) a first sheet accommodating portion for accommodating a plurality of developing sheets cooperating with the photosensitive pressure-sensitive sheet;

(c) a second sheet accommodating portion for accommodating a plurarity of silver chloride sheets;

(d) a transferring mechanism for transferring the photosensitive pressure-sensitive sheet so as to form an exposing portion located opposite to the cathode ray tube, the silver chloride sheet being selectively portioned at the exposing portion;

(e) a pressure developing unit disposed along a transferring path of the photosensitive pressure-sensitive sheet for transferring a latent image formed on the photosensitive pressure-sensitive sheet onto the developing sheet fed from the first sheet accommodating portion;

(f) a heat-fixing unit for fixing an image on the developing sheet or the silver chloride sheet; and

(g) a controlling circuit for controlling the cathode ray tube, which comprises an image signal inverting means for inverting a polarity of an image signal so as to invert light and darkness of an image formed on the cathode ray tube and/or a deflecting circuit for inverting an image formed on the cathode ray tube in a mirror image relationship.

5,010,361

COPYING DEVICE FOR MODIFYING (DISTORTING) FILM PATTERNS

Michael Wulff, Grambeker Weg 161, D-2410 Mölln, Fed. Rep. of Germany

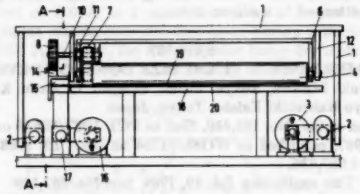
Filed Dec. 7, 1989, Ser. No. 447,222

Claims priority, application Fed. Rep. of Germany, Dec. 7, 1988, 3841100

Int. Cl.[5] G03B *27/68*

U.S. Cl. 355—52 **4 Claims**

1. A copying device for modification of a film pattern which is arranged on a film to be exposed, is moved relative to the film corresponding to a desired elongation or compression by means of moving a holder, and is exposed by a light source which is moved over the film pattern and film in an axial direction fixed by the relative movement between the film pattern and the film, wherein at least one contact pressure roller rolling in the pattern is moved along with its light source, the holder (**15**) being arranged only on one side so as to clamp an adjoining edge of the film pattern which extends



parallel to the axial direction of the relative movement between the film pattern (**19**) and the film (**20**) and the movement of the light source (**1**), the at least one contact pressure roller (**4, 5**) being coupled with the holder (**15**) so as to move with said holder (**15**).

5,010,362

IMAGE PROJECTING SYSTEM

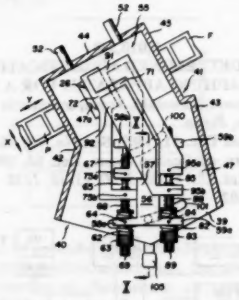
Hajime Otsuki; Osami Kato, and Hideaki Kusano, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 222,402, Jul. 21, 1988, abandoned. This application Sep. 4, 1990, Ser. No. 579,183

Claims priority, application Japan, Jul. 21, 1987, 62-182056; Jul. 21, 1987, 62-182057

Int. Cl.[5] G03B *27/58*

U.S. Cl. 355—74 **25 Claims**



1. In an image projecting device which causes a light from a light source to impinge on a film and projects an image on said film onto an image receiver through a projection lens, the improvement comprising:

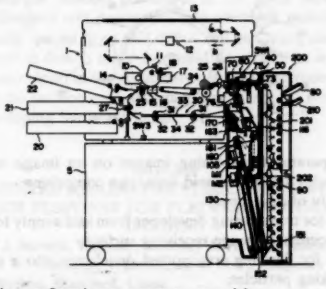
masking means for intercepting an optical path from said light source to said image receiver, the masking means being formed integrally with said projection lens, and

means for rotating the masking means, said masking means being rotatable around the optical axis relative to the film.

5,010,363
IMAGE FORMING APPARATUS HAVING SHEET JAM REACTION RESET MEANS

Kimihiko Higashio, Osaka, and Takeshi Yoshikai, Minokamo, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Dec. 29, 1989, Ser. No. 459,122
Claims priority, application Japan, Dec. 30, 1988, 63-333169; Dec. 30, 1988, 63-333171
Int. Cl.[5] G03G *15/00*
U.S. Cl. 355—206 5 Claims



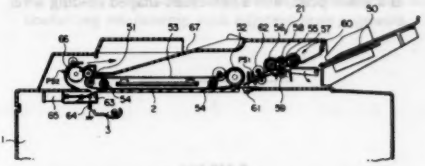
1. An image forming apparatus comprising:
an image forming section where an image is formed on a sheet;
a sheet handling section for receiving printed sheets from the image forming section, said sheet handling section being operable in an ejection mode of ejecting printed sheets outside and in a mode of collecting printed sheets inside thereof to process the sheets;
means provided in the sheet handling section for detecting a sheet, which means is disposed in a sheet path taking sheets outside said sheet handling section;
means for detecting the occurrence of a sheet jam at each part in the sheet handling section;
means for reacting to a sheet jam by discontinuing the operation of the apparatus in response to a jam signal generated from the sheet jam detecting means; and
means for resetting the sheet jam reaction, when the apparatus is relieved of the sheet jam, by canceling the discontinuance of the operation of the apparatus in accordance with the operation mode in which the sheet handling section was operated before the discontinuance,
wherein when the operation mode of the sheet handling section before the discontinuance is the ejection mode, the jam reaction resetting operation is executed in response to a signal indicating that the sheet detecting means does not detect a sheet after the jam reacting operation.

5,010,364
COPIER WITH AUTOMATIC DOCUMENT FEED HAVING JAM PREVENTION FUNCTION

Yoshikazu Maekawa, and Tetsuo Hirata, both of Tokyo, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Feb. 1, 1990, Ser. No. 473,475
Claims priority, application Japan, Feb. 3, 1989, 1-23673; Feb. 3, 1989, 1-23674
Int. Cl.[5] G03G *21/00*
U.S. Cl. 355—207 5 Claims

1. An apparatus for sequentially copying plural sheets of documents, comprising:
a sheet passage through which the documents are fed;
a document platen on which the documents are copied, said document platen forming a part of said sheet passage;
feeding means for feeding the documents onto said document platen through said sheet passage;
stop means movable between a first position and a second position, said stop means being positioned to contact a fed document to stop it at a predetermined position on said document platen when in said first position and said stop means being positioned so as not to contact a fed document when in said second position;
sensing means for detecting a document longer than a predetermined length prior to the document contacting the stop means; and

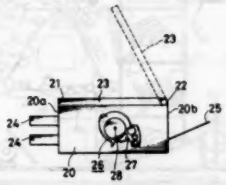


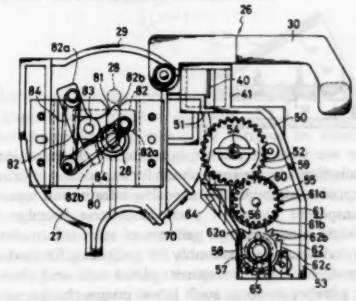
control means, responsive to the detection of a document longer than the predetermined length, for moving the stop means to the second position prior to the detected document contacting the stop means.

5,010,365
ELECTROPHOTOGRAPHIC APPARATUS HAVING POSITIONING MECHANISM FOR DETACHABLE PROCESS CARTRIDGE

Sunao Hatanaka, Takizawa, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed Feb. 7, 1989, Ser. No. 307,863
Claims priority, application Japan, Mar. 31, 1988, 63-41844[U]
Int. Cl.[5] G03G *15/00*
U.S. Cl. 355—211 3 Claims





1. An electrophotographic apparatus having a process cartridge including a cleaner and a photosensitive drum, said photosensitive drum rotating on a rotational shaft detachably mounted in a housing having a driving mechanism for driving said photosensitive drum arranged thereon, said apparatus comprising:
an opening formed at the top of said housing openable by a cover for inserting and removing said process cartridge; and
a positioning mechanism for positioning the rotational shaft inserted through said opening at a predetermined position

capable of transmitting the drive of said driving mechanism to the rotational shaft;

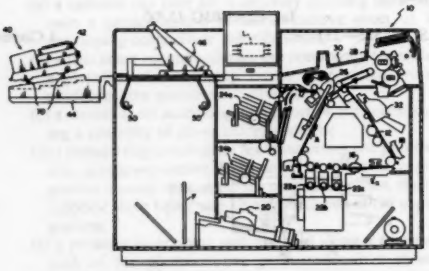
wherein said positioning mechanism includes means for mounting said process cartridge in said housing in a single action and for dismounting said process cartridge from said housing in a single action, and including a slit formed at a guide plate, and a bell-crank-shaped holding lever.

5,010,366

SLIDE TRANSPARENCY PROJECTOR APPARATUS FOR USE WITH AN ELECTROPHOTOGRAPHIC REPRODUCTION MACHINE

Carlton J. Baxter, Penfield, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 15, 1989, Ser. No. 366,396
Int. Cl.[5] G03G *15/04*
U.S. Cl. 355—240 9 Claims



1. For use with an electrophotographic reproduction machine including a transparent platen for supporting information to be reproduced, means for exposing information located on said transparent platen, a photoconductive member upon which latent image charge patterns of such information are formed, and a main lens assembly for projecting focused image of information on said transparent platen onto said photoconductive member to form such latent image charge patterns, apparatus for enabling said electrophotographic reproduction machine to make reproductions of slide transparencies, said apparatus comprising:

means for projecting a real image of a slide transparency along an optical path onto said transparent platen;

a Fresnel lens; and

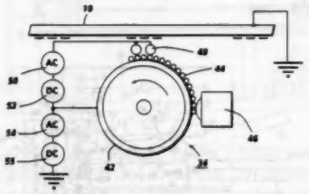
means for supporting said Fresnel lens in said optical path of said projecting means as a field lens for said main lens assembly, said supporting means maintaining said Fresnel lens in spaced relation to said transparent platen beyond the depth of focus of said main lens assembly.

5,010,367

DUAL AC DEVELOPMENT SYSTEM FOR CONTROLLING THE SPACING OF A TONER CLOUD

Dan A. Hays, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 11, 1989, Ser. No. 448,407
Int. Cl.[5] G03G *15/08*
U.S. Cl. 355—247 32 Claims



1. Apparatus for forming images on an image receiving surface with developer, said apparatus comprising:

a supply of developer;

means for transporting developer from said supply to an area adjacent said image receiving surface;

means for forming transported developer into a cloud of marking particles;

means for controlling the spacing of said marking particle cloud relative to said image receiver without interacting with said image receiving surface; and

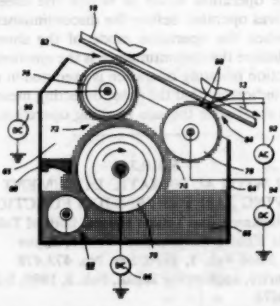
means for establishing a development field between said transporting means and said image receiving surface for causing an image on said image receiving surface to be developed with marking particles.

5,010,368

MAGNETIC TRANSPORT ROLL FOR SUPPLYING TONER OR CARRIER AND TONER TO A DONOR AND MAGNETIC DEVELOPER ROLL RESPECTIVELY

John F. O'Brien, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Feb. 20, 1990, Ser. No. 482,110
Int. Cl.[5] G03G *15/06*
U.S. Cl. 355—259 3 Claims



1. An electrophotographic printing machine of the type having an electrostatic latent image recorded on a photoconductive surface developed by toner to form a visible image thereof, wherein the improvement includes:

a housing defining a chamber adapted to store a supply of developer material comprising at least carrier and toner therein;

a donor roll positioned at least partially in the chamber of said housing, said donor roll being adapted to deliver toner to the surface to develop the latent image recorded thereon with toner;

a magnetic developer roll spaced from said donor roll and positioned at least partially in the chamber of said housing, said developer roll being adapted to deliver developer material to the surface to develop the latent image recorded thereon with toner;

a magnetic transport roll adapted to transport developer material to a first loading zone where a portion of the developer material is attracted to said magnetic developer roll with the remainder of the developer material being transported to a second loading zone where toner is attracted from carrier to said donor roll, and

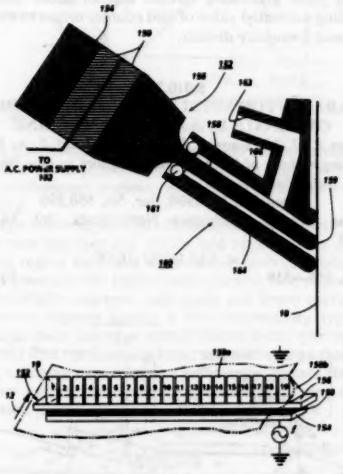
an electrode member positioned in the space between the surface and said donor roll, said electrode member being closely spaced from said donor roll and being electrically biased to detach toner from said donor roll so as to form a toner cloud in the space between said electrode member and the surface with detached toner from the toner cloud developing the latent image.

5,010,369

SEGMENTED RESONATOR STRUCTURE HAVING A UNIFORM RESPONSE FOR ELECTROPHOTOGRAPHIC IMAGING

William J. Nowak, Webster; Anthony A. Attardi, Rochester, and Daniel W. Costanza, Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jul. 2, 1990, Ser. No. 548,517
Int. Cl.[5] G03G *15/14*
U.S. Cl. 355—273 **15 Claims**



1. In an imaging device having a non-rigid member with a charge retentive surface moving along an endless path, means for creating a latent image on the charge retentive surface, means for imagewise developing the latent image with toner, means for electrostatically transferring the developed toner image to a copy sheet, and a resonator for enhancing toner release from the charge retentive surface and producing relatively high frequency vibratory energy, and having a portion thereof adapted for contact across the flexible belt member, generally transverse to the direction of movement thereof, the resonator comprising:

a horn member for applying the high frequency vibratory energy to the belt member, having a platform portion, a horn portion, and a contacting portion;

vibratory energy producing means coupled to said horn platform, for generating the high frequency vibratory energy;

support means for supporting the combination of said vibratory energy producing means and said horn member;

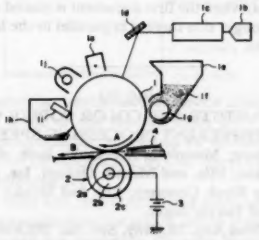
said horn member divided into a plurality of horn segments across said belt member, each horn segment including horn portion and contacting portion in substantially non-contacting relationship with adjacent horn segments.

5,010,370

TRANSFER APPARATUS AND IMAGE BEARING APPARATUS USING SAME HAVING TRANSFER MEANS FOR CONTACTING A BACKSIDE OF A TRANSFER MATERIAL

Junji Araya, Yokohama; Yukihiro Ohzeki, Kashiwa; Toshio Miyamoto, Tokyo; Koichi Hiroshima, Yokohama; Yasushi Sato, and Kimio Nakahata, both of Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 24, 1989, Ser. No. 426,002
Claims priority, application Japan, Oct. 29, 1988, 63-271990
Int. Cl.[5] G03G *15/16*
U.S. Cl. 355—274 **14 Claims**



1. An image forming apparatus, comprising:

an image bearing member;

latent image forming means for forming an electrostatic latent image on said image bearing member;

developing means for developing an electrostatic latent image formed on said image bearing member into a toner image with toner;

transfer means for contacting a backside of the transfer material, for urging the transfer material to said image bearing member having the toner image and for applying a transfer bias to transfer the toner image to the transfer material;

wherein amounts of electric charge applied to the transfer material by said transfer means during a transfer operation satisfy the relation:

$$A \geq B/2$$

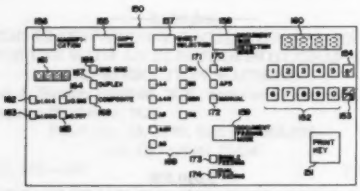
where A is an amount of the charge at a portion of the transfer material where the toner is present, and B is an amount of the charge at a portion of the transfer material where the toner is absent.

5,010,371

COPYING APPARATUS PROVIDED WITH AUTOMATIC DOCUMENT FEEDER

Hirokazu Matsuo, and Hiroyasu Nagato, both of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 192,371, May 10, 1988, abandoned.
This application Jan. 23, 1990, Ser. No. 469,702
Claims priority, application Japan, May 12, 1987, 62-115336; May 18, 1987, 62-121648; May 20, 1987, 62-124140; May 20, 1987, 62-124141; May 20, 1987, 62-124142; May 20, 1987, 62-124143
Int. Cl.[5] G03G 21/00
U.S. Cl. 355—313 11 Claims



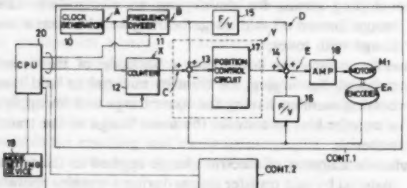
1. A copying apparatus comprising:
a rectangular platen;
transporting means for sequentially feeding first and second original documents and placing them on said platen side by side in the document feeding direction;
image forming means for copying the images of the documents placed side by side on said platen to a single surface of a copy sheet;
detecting means for detecting the size of a document fed by said transporting means; and
control means for inhibiting the operation of feeding the second document by said transporting means and allowing said image forming means to form the image of the first document, when the first document is placed on the platen with its longer side thereof in parallel to the longer side of said platen.

5,010,372

BLACK-AND-WHITE AND COLOR COPIER OPERABLE AT DIFFERENT PROCESSING SPEEDS

Nobuo Kasahara; Masayoshi Watanuki, both of Yokohama; Satoru Maeno, Mie, and Masato Ohkuni, Ise, all of Japan, assignors to Ricoh Company, Ltd. and Shinko Electric Co., Ltd., both of Tokyo, Japan

Filed Aug. 28, 1989, Ser. No. 398,916
Claims priority, application Japan, Sep. 2, 1988, 63-220091
Int. Cl.[5] G03G 21/00
U.S. Cl. 355—313 6 Claims



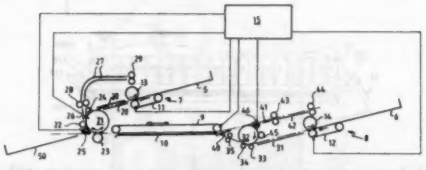
1. A copying machine with a variable process speed having a black-and-white copying mode and color copying mode, comprising:
a scanning optical system for optically scanning an original document, having color filters used in said color copying mode for decomposing color into red, green and blue;
a first drive unit for driving said scanning optical system;
a photosensitive means for obtaining a latent image of said original document, in association with said scanning optical system;
a second drive unit for driving said photosensitive means;
developer means for developing said latent image, having a black developer for developing said latent image obtained without said color filters in said black-and-white copying mode and a yellow developer, a magenta developer and a cyan developer for developing said latent image in respective complementary colors to red, green and blue in said color copying mode;
transfer means rotated in proximity to said photosensitive means and for transferring said developed latent image onto a transfer paper held on a transfer means to provide a copy of the original document;
a third drive unit for driving said transfer means;
a drive condition setting device for judging a designated copy mode and for giving speeds of said respective drive units varying in accordance with respective copy modes, having a pulse generating circuit for generating a series of pulses for controlling operations of said respective drive units, a frequency divider for dividing said series of pulses, and a frequency dividing ratio selecting means for selecting a frequency dividing ratio of said series of pulses to provide a series of divided pulses having a present frequency such that the speeds of the respective drive units are suitable for the designated copy mode; and
accelerating means for accelerating said speeds of said respective driving units in order to correct operating positions of said respective drive units, and having counter means for counting a given number of pulses generated by said pulse generating circuit, and an adder means for adding a counted value of said counter means to an output of said frequency divider.

5,010,373

APPARATUS FOR SUPPLYING AND DISCHARGING ORIGINALS IN A COPYING MACHINE

Johannes L. J. M. Linssen, Baarlo, and Jozef J. A. Pleyers, Panningen, both of Netherlands, assignors to Oce Nederland B.V., Netherlands

Filed Jul. 10, 1990, Ser. No. 550,390
Claims priority, application Netherlands, Jul. 14, 1989, 8901828
Int. Cl.[5] G03G 21/00
U.S. Cl. 355—319 10 Claims



1. In an apparatus for supplying and discharging originals in a copying machine comprising: a first cassette and a second cassette for originals; a first feed path for feeding originals from the first cassette to an imaging means of the copying machine and so formed that the originals are fed to the imaging means in a reversed orientation; a second feed path for feeding originals from the second cassette to the imaging means; a turnover path for turning over originals coming from the imaging means and returning them to the imaging means; a first discharge path for discharging originals from the imaging means to the first cassette and so formed that the originals are deposited in the first cassette in a reversed orientation; and a control means for controlling the transport of the originals; the improvement comprising: the second feed path being so formed that the originals are fed to the imaging means in the same orientation

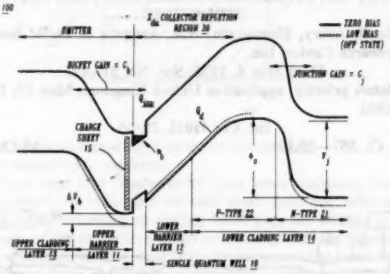
as they had in the second cassette; a second discharge path is provided to discharge originals from the imaging means to the second cassette and is so formed that originals are deposited in the second cassette in the same orientation as they had when leaving the imaging means; and wherein the control means is so constructed that: (a) duplex originals, at least in the production of the first up to and including the penultimate set of copies, are fed from the cassette in which they are situated to the imaging means and, after both sides have been copied, are discharged to the other cassette, and (b) simplex originals, at least in the production of the second up to and including the last set of copies, are fed from the same cassette to the imaging means.

5,010,374

QUANTUM WELL LASER UTILIZING AN INVERSION LAYER

Paul W. Cooke, Fair Haven, and Geoffrey W. Taylor, Holmdel, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jun. 5, 1990, Ser. No. 533,549
Int. Cl.[5] H01L *29/161, 33/00*; H01S *3/19*
U.S. Cl. 357—16 **9 Claims**



1. In a laser comprising a quantum well region forming first and second heterojunction interfaces with upper and lower carrier confinement regions, respectively, the improvement comprising

a charge sheet formed substantially near said first heterojunction interface and within said upper carrier confinement region such that an inversion layer is produced in said quantum well region, said quantum well region being substantially undoped, said upper and lower carrier confinement regions having a first conductivity type, said charge sheet having a second conductivity type opposite to said first conductivity type, and said charge sheet having a doping concentration sufficiently greater than said upper carrier confinement region for producing said inversion layer.

5,010,375

SEMICONDUCTOR LASER DEVICE

Yoshito Seiwa, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed May 17, 1989, Ser. No. 353,029
Claims priority, application Japan, May 23, 1988, 63-126111
Int. Cl.[5] H01L *29/161*
U.S. Cl. 357—16 **5 Claims**

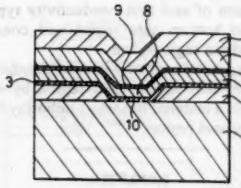
1. A semiconductor laser device comprising:

a first conductivity type Si substrate;

a current confinement layer comprising a second conductivity type Si disposed on said substrate and having an aperture extending through said current confinement layer to said substrate;

a plurality of compound semiconductor layers including successively disposed lower cladding, active, and upper cladding layers comprising AlGaAs and GaAs disposed opposite said current confinement layer, opposite said Si substrate, and in said aperture in said current confinement layer forming a semiconductor laser; and

an AlGaAs buffer layer disposed between and in contact



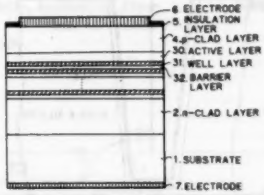
with said Si substrate and said plurality of compound semiconductor layers for relieving stress caused by the difference in lattice constants between said substrate and said plurality of compound semiconductor layers.

5,010,376

LIGHT EMITTING HETEROJUNCTION SEMICONDUCTOR DEVICE

Kohsuke Nishimura, and Kazuo Sakai, both of Tokyo, Japan, assignors to Kokusai Denshin Denwa Co., Ltd., Tokyo, Japan

Filed Jul. 31, 1990, Ser. No. 560,692
Claims priority, application Japan, Sep. 1, 1989, 1-224712
Int. Cl.[5] H01L *27/14*
U.S. Cl. 357—17 **13 Claims**



1. A light emitting semiconductor device comprising;

a substrate made of one selected from III-V group compound semiconductor, and group IV semiconductor,

an active layer (3) sandwiched by clad layers (2,4) deposited on said substrate (1),

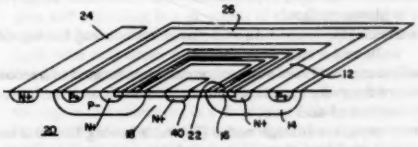
said active layer and clad layers being made of group II-VI compound semiconductor which lattice matches with the substrate, and has essentially the same linear thermal expansion coefficient as that of the substrate.

5,010,377

ISOLATED GATE MESFET AND METHOD OF TRIMMING

James D. Beasom, Melbourne Village, Fla., assignor to Harris Corporation, Melbourne, Fla.

Division of Ser. No. 164,342, Mar. 4, 1988, Pat. No. 4,418,746.
This application Jun. 14, 1990, Ser. No. 537,936
Int. Cl.[5] H01L *29/80*
U.S. Cl. 357—22 **28 Claims**



1. A junction field effect transistor comprising:

a drain region of a first conductivity type;
an annular bottom gate region of a second conductivity type in said drain region;
a source region of said first conductivity type in said annular bottom gate region;
a channel region of said first conductivity type extending through said bottom gate region and connecting said source and drain regions; and
an annular top gate in contact with said channel region, and isolated from said bottom gate region by said channel region, and of a material forming a Schottky barrier diode with said channel region.

5,010,378

TAPERED TRENCH STRUCTURE AND PROCESS

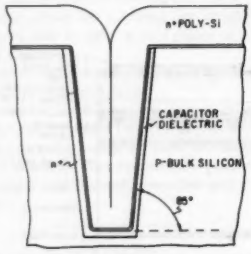
Monte A. Douglas, Coppell, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 296,397, Jan. 6, 1989, Pat. No. 4,916,511, which is a continuation of Ser. No. 10,374, Feb. 3, 1987, abandoned, which is a division of Ser. No. 841,391, Mar. 19, 1986, Pat. No. 4,690,729, which is a continuation-in-part of Ser. No. 730,701, May 3, 1985, Pat. No. 4,702,795. This application Feb. 20, 1990, Ser. No. 481,430

The portion of the term of this patent subsequent to Apr. 10, 2007, has been disclaimed.

Int. Cl.[5] H01L *29/68, 29/06, 27/02*

U.S. Cl. 357—23.6 **10 Claims**



1. An integrated circuit, comprising:
(a) a semiconductor layer with a surface;
(b) at least one memory cell at said surface, said memory cell including a capacitor and an access device connected to said capacitor;
(c) wherein said capacitor has a plate along a sidewall of a trench that extends from said surface into said layer, said trench with an aspect ratio of at least 2.5 to 1 and positively sloping sidewalls without bowing or undercut.

5,010,379

SEMICONDUCTOR MEMORY DEVICE WITH TWO STORAGE NODES

Tatsuya Ishii, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

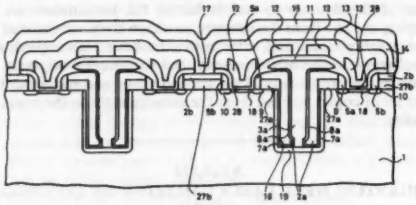
Filed Jun. 22, 1989, Ser. No. 369,965

Claims priority, application Japan, Aug. 26, 1988, 63-213209

Int. Cl.[5] H01L *27/10, 29/06, 27/02*

U.S. Cl. 357—23.6 **15 Claims**

7. A semiconductor memory device comprising:
a first conductivity type semiconductor substrate (**1**) having a planar surface,
a trench (**16**) formed on said planar surface and having side walls and a bottom surface,
a first region (**19**) of a capacitor cell plate formed of a second conductivity type layer on the side walls and the bottom surface of said trench,
two capacitor storage nodes (*2a*) each having first and second surfaces thereof covered by respective capacitor dielectric films (*7a* and *8a*) and formed along the side walls of said trench, said two storage nodes facing each other,
a second region (*3a*) of said cell plate formed of an electrically conductive material, said second region being interposed between said two storage nodes (*2a*) and electrically connected to said first region (**19**) of the cell plate at the bottom surface of said trench (**16**), and
field effect transistors (**9**, **10**, **12**, **18** and **28**) each connected to one of said storage nodes (*2a*) and formed on said planar surface.



5,010,380

VOLTAGE STRESS ALTERABLE ESD PROTECTION STRUCTURE

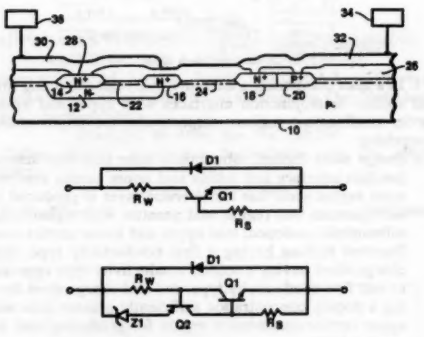
Leslie R. Avery, Flemington, N.J., assignor to David Sarnoff Research Center, Inc.

Filed May 4, 1990, Ser. No. 516,497

Claims priority, application United Kingdom, May 17, 1989, 8911360

Int. Cl.[5] H01L *29/06*

U.S. Cl. 357—23.13 **15 Claims**



1. A protection circuit comprising:
a semiconductor substrate of a first conductivity type having a surface;
a well region of second conductivity type in the substrate at the surface thereof, the well region of second conductivity type having disposed therein spaced first and second regions of second conductivity type having relatively higher conductivity than the well region;
a third region of first conductivity type in the substrate at the surface thereof and spaced from the well region;
a fourth region of second conductivity type in the substrate at the surface thereof spaced from the well region and adjacent the third region;
a terminal overlying and contacting the surface over the first region; and
a field layer of first conductivity type in the substrate and adjacent the surface thereof extending completely between the first and second regions and completely between the third and fourth regions;

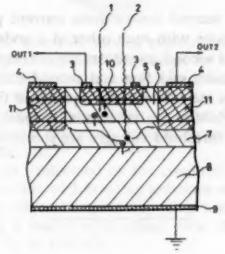
said circuit forming a first transistor of a first conductivity type in which the fourth region of second conductivity type forms the emitter, the substrate forms the base region, and the second region forms the collector; a diode formed between the well region and the substrate; a resistor formed by the portion of the well region between the first and second regions; and a resistor formed by the portion of the substrate between the second and the third regions.

5,010,381

SEMICONDUCTOR LIGHT RECEIVING ELEMENT

Tetsuo Shiba, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Feb. 28, 1990, Ser. No. 486,354
Claims priority, application Japan, Aug. 24, 1989, 1-219903
Int. Cl.[5] H01L *27/14*
U.S. Cl. 357—30 **15 Claims**



1. A semiconductor light detector comprising:
a semiconductor substrate;
at least two first conductivity type semiconductor layers successively disposed on said semiconductor substrate, each layer having an energy band gap, the energy band gaps of the respective layers increasing from the substrate to the layer most distant from the substrate, the layer most distant from the substrate including a light incident surface;
a first second conductivity type semiconductor region disposed at the surface extending into the layer most distant from the substrate; and
a successive second conductivity type semiconductor region corresponding to each first conductivity type layer between the most distant first conductivity type layer and the substrate extending from the surface to the corresponding layer, each successive second conductivity type region being successively disposed more remotely from the first second conductivity type region.

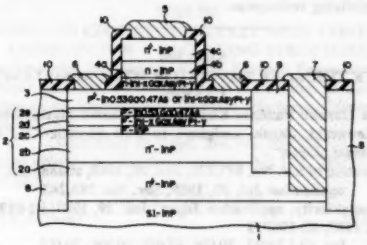
5,010,382

HETEROJUNCTION BIPOLAR TRANSISTOR HAVING DOUBLE HETERO STRUCTURE

Riichi Katoh, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 4, 1989, Ser. No. 445,984
Claims priority, application Japan, Dec. 9, 1988, 63-311753; Feb. 14, 1989, 1-34405
Int. Cl.[5] H01L *29/72, 27/12, 29/161*
U.S. Cl. 357—34 **10 Claims**

1. A double heterojunction bipolar transistor, comprising:
a first conductivity type emitter layer;
a second conductivity type base layer which is in contact with the emitter layer and forms a first heterojunction in conjunction with the emitter layer; and
a collector layer which is in contact with the base layer, said collector layer being made up of a first conductivity type semiconductor layer and a second conductivity type semiconductor layer and including a second conductivity type low-impurity concentration layer which is in contact with the base layer such that the low-impurity concentration layer has an impurity concentration lower than that of the base layer, said collector layer forming a second heterojunction in conjunction with the base layer, the second heterojunction including a transition layer which is



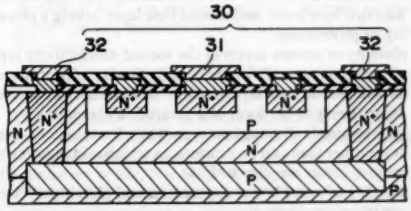
formed such that the band gap thereof varies stepwise or smoothly, said transition layer being isolated from the base layer, and said emitter layer and said collector layer being formed of a semiconductor material having a band gap wider than that of the base layer.

5,010,383

POWER TRANSISTOR DEVICE AND METHOD FOR MAKING THE SAME

Masaharu Wataguchi, Ota, Japan, assignor to Sanyo Electric Co. Ltd., Osaka, Japan

Continuation of Ser. No. 310,781, Feb. 14, 1989, abandoned. This application Oct. 11, 1990, Ser. No. 596,737
Claims priority, application Japan, Feb. 18, 1988, 63-35662
Int. Cl.[5] H01L *29/72*
U.S. Cl. 357—36 **9 Claims**



1. A power transistor device comprising:
a collector region made of a first conductivity type and having an upper surface;
a base region made of a second conductivity type and provided within said collector region and having an upper surface flush with said upper surface of said collector region;
an elongated resistor region provided within said base region and having said first conductivity type and having an upper surface flush with said upper surface of said base region, said elongated resistor region forming first and second emitter stabilizing resistances which are aligned substantially linearly;
a first elongated emitter region provided within said base region located on one side of said elongated resistor region and extending in a direction of elongation parallel to said elongated resistor region and having an upper surface flush with said upper surface of said base region:
a second elongated emitter region provided within said base region located on an opposite side of said elongated resistor region and extending in a direction of elongation parallel to said elongated resistor region and having an upper surface flush with said upper surface of said base region;

connecting means for electrically connecting said first and second elongated emitter regions respectively with opposite ends of said elongated resistor region; and

emitter electrode means connected to said elongated resistor region at an area between said first and second emitter stabilizing resistances.

5,010,384

GATE TURN-OFF THYRISTOR WITH RESISTANCE LAYERS

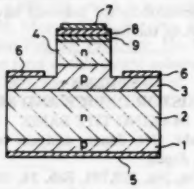
Hiromu Haruki; Fumiaki Kirihata, and Osamu Hashimoto, all of Kawasaki, Japan, assignors to Fuji Electric Co., Ltd., Kawasaki, Japan

Continuation of Ser. No. 147,738, Jan. 25, 1988, abandoned. This application Jul. 20, 1989, Ser. No. 383,263

Claims priority, application Japan, Jan. 29, 1987, 62-018963; Aug. 6, 1987, 62-196911

Int. Cl.[5] H01L *29/74, 27/02, 29/06, 29/52*

U.S. Cl. 357—38 **2 Claims**



2. A gate turn-off thristor, comprising:

a first main electrode;

an emitter layer of a first conductivity type disposed on said first main electrode;

a first base layer of a second conductivity type disposed on said emitter layer;

a second base layer of the first conductivity type disposed on said first base layer, said second base layer having a plurality of protrusions;

a plurality of emitter layers of the second conductivity type disposed on respective ones of said plurality of protrusions of said second base layer, each of said plurality of emitter layers being in the form of a protruded island;

a gate electrode disposed on a portion of said second base layer other than said protrusions on which said plurality of emitter layers are disposed;

a plurality of metal layers disposed on said plurality of emitter layers, respectively;

a plurality of resistance layers disposed on said plurality of metal layers, respectively; and

a plurality of second main electrodes disposed on said plurality of resistance layers;

wherein each respective one of said plurality of resistance layers, in the respective direction of the thickness of each of said plurality of resistance layers, has a resistance within a range from 15 to 500 $m\Omega \cdot mm^2$.

5,010,385

RESISTIVE ELEMENT USING DEPLETION-MODE MOSFET'S

Patrick A. Shoemaker, Lemon Grove, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 30, 1990, Ser. No. 502,701

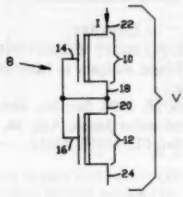
Int. Cl.[5] H01L *27/02*

U.S. Cl. 357—41 **12 Claims**

1. A linear resistance element, comprising:

a first depletion-type field effect transistor having a gate, a source electrode, a drain electrode, a first channel width-to-length ratio, a first channel mobility, and a first threshold voltage, said source and drain electrodes defining a first source-drain current path; and

a second depletion-type field effect transistor having a gate, a source electrode, a drain electrode, a second channel width-to-length ratio, a second channel mobility, and a second threshold voltage, said source and drain electrodes defining a second source-drain current path; wherein



said first and second source-drain current paths are connected in series with each other at a node, said gates of said first and second transistors are connected in common with said node, said first and second channel width-to-length ratios are substantially equal, said first and second channel mobilities are substantially equal, and said first and second threshold voltages are substantially equal.

5,010,386

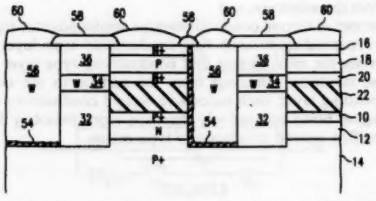
INSULATOR SEPARATED VERTICAL CMOS

Robert Groover, III, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 26, 1989, Ser. No. 457,030

Int. Cl.[5] H01L *27/02, 29/06, 29/10, 27/01*

U.S. Cl. 357—42 **16 Claims**



1. A complementary semiconductor device structure comprising:

a substrate of a first conductivity type;

a first channel layer of a second conductivity type formed on the surface of said substrate;

a first source/drain layer of said first conductivity type formed on the surface of said first channel layer;

an insulating layer formed on the surface of said first source/drain layer;

a second source/drain layer of said second conductivity type formed on the surface of said insulating layer;

a second channel layer of said first conductivity type formed on the surface of said second source/drain layer;

a third source/drain layer of said second conductivity type formed on the surface of said second channel layer; and

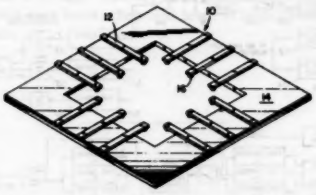
gate circuitry vertically disposed on an edge perpendicular to the plane of and adjacent to said first and second channel layers, and insulated therefrom.

5,010,387

SOLDER BONDING MATERIAL

Thomas J. Dunaway, St Louis Park; Richard K. Spielberger, Maple Grove; Lori A. Dicks, New Hope, and Jerald M. Loy, Anoka, all of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Nov. 21, 1988, Ser. No. 274,412
Int. Cl.[5] H01L *23/48, 23/54*
U.S. Cl. 357—70 14 Claims



1. A leadframe assembly having conductive elements preformed with high strength solder bumps for use in interconnecting the leadframe with an electronic device comprising:

a) leadframe means comprising at least one of power, ground, and signal conductive elements for transmitting input and output signals to bonding locations on an electronic device; and

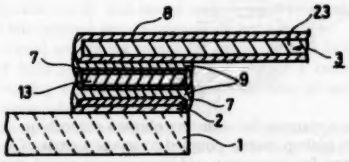
b) solder bumps preformed on the conductive elements for selective bonding with bonding locations on the electronic device, the solder bumps comprising a composition for maintaining a single solid phase over the temperature range of 0° C. to 150° C.

5,010,388

CONNECTION STRUCTURE BETWEEN COMPONENTS FOR SEMICONDUCTOR APPARATUS

Akira Sasame; Hitoyuki Sakanoue; Hisao Takeuchi; Masaya Miyake; Akira Yamakawa; Yasuhisa Yushio, and Hitoshi Akazawa, all of Hyogo, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Jun. 28, 1988, Ser. No. 212,944
Claims priority, application Japan, Jul. 3, 1987, 62-165190; Jul. 14, 1987, 62-175070; Oct. 30, 1987, 62-275277; Dec. 15, 1987, 62-315330
Int. Cl.[5] H01L *23/48, 23/02, 39/02, 29/44*
U.S. Cl. 357—70 9 Claims



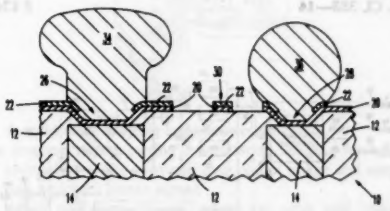
1. A connection structure between components of a semiconductor apparatus, comprising: a base member made of aluminum nitride having a major surface on which a semiconductor device is to be mounted, said aluminum nitride having a first thermal expansion coefficient, a connection member to be joined to said base member, said connection member being made of an alloy selected from the group consisting of iron-nickel alloys and iron-nickel-cobalt alloys having a second thermal expansion coefficient, a plastically deformable stress relieving member interposed between said aluminum nitride base member and said connection member, and a soldering material for joining said base member, said stress relieving member, and said connection member, said plastically deformable stress relieving member being made of a material selected from the group consisting of copper, copper alloys, nickel alloys, iron, and aluminum having a plastic deformability sufficiently high for relieving a thermal stress caused by a difference between said first and second thermal expansion coefficients of said base member and of said connection member during a cooling process at the time of soldering.

5,010,389

INTEGRATED CIRCUIT SUBSTRATE WITH CONTACTS THEREON FOR A PACKAGING STRUCTURE

Peter Gansauge, Boeblingen; Volker Kreuter, Schoenaich, and Helmut Schettler, Dettenhausen, all of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 29, 1990, Ser. No. 529,827
Claims priority, application European Pat. Off., Jul. 26, 1989, 89113765.5
Int. Cl.[5] H01L *23/48*
U.S. Cl. 357—67 18 Claims



1. An integrated circuit substrate with contacts thereon for a packaging structure comprising:

a substrate with at least one terminal means,

a conductive layer on said substrate covering at least a portion of said terminal means;

a conductive bump on at least a portion of said conductive layer;

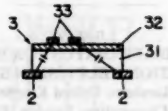
an insulator layer on said conductive layer around at least a portion of said conductive bump, and wherein at least a portion of said insulator layer is underneath said conductive bump.

5,010,390

PLASTIC-MOLDED SEMICONDUCTOR DEVICE

Shigeru Tanaka, Fujisawa, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 640,875, Aug. 15, 1984, Pat. No. 4,768,078. This application Sep. 3, 1987, Ser. No. 92,521
Claims priority, application Japan, Aug. 31, 1983, 58-160124
The portion of the term of this patent subsequent to Aug. 30, 2005, has been disclaimed.
Int. Cl.[5] H01L *23/28, 23/48*
U.S. Cl. 357—72 1 Claim



1. A device comprising:

a semiconductor pellet having an insulating substrate with a periphery along an outer edge of said insulating substrate,

an integrated circuit formed on said insulating substrate, and

a pellet mounting member on which said semiconductor pellet is mounted, said pellet mounting member having a lead frame with a conductive support means for supporting said insulating substrate in a manner to produce a reduced parasitic capacitance by contacting said insulating substrate only at the periphery of said insulating sub-

strate, wherein said device is a plastic-molded semiconductor device,

wherein said lead frame has an inner lead, wherein said conductive support means is in form of a substantially rectangular ring of substantially the same size as said semiconductor pellet, and said substantially rectangular ring is connected to an end of said inner lead of said lead frame.

5,010,391

DIGITAL VIDEO SIGNAL PROCESSING DEVICE

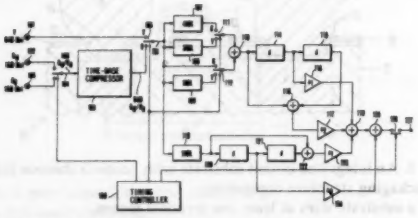
Makoto Shimokoriyama, Kanagawa, and Toshihiro Yagisawa, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 24, 1988, Ser. No. 261,915

Claims priority, application Japan, Oct. 27, 1987, 62-272281; Oct. 27, 1987, 62-272284

Int. Cl.[5] H04N *11/10*

U.S. Cl. 358—14 **5 Claims**



1. A digital video signal processing device, comprising:

(a) time-division multiplexing means for providing a time-division multiplexed signal by time-division multiplexing a digital luminance signal with a line-sequential digital color difference signal for each horizontal scanning line;

(b) a digital filter for limiting a bandwidth of said time-division multiplexed signal in a two-dimensional frequency region, said digital filter including a delay circuit for delaying said time-division multiplexed signal;

(c) sampling means for subsampling said time-base multiplexed signal output from said digital filter; and

(d) control means for controlling a bandwidth to be limited by said digital filter, said control means including a switching circuit for switching a delay time of said delay circuit so that said digital luminance signal is delayed for a first delay time and said line-sequential digital color differential signal is delayed for a second delay time which is different from the first delay time where said bandwidth is determined corresponding to a two-dimensional frequency by said sampling means for said digital luminance signal and said line-sequential digital color difference signal.

5,010,392

METHOD OF AND APPARATUS FOR RECEIVING HIGH DEFINITION TELEVISION SIGNALS

Michael G. Croll, Horsham, United Kingdom, assignor to British Broadcasting Corporation, London, England

Filed Jul. 28, 1989, Ser. No. 386,785

Claims priority, application United Kingdom, Jul. 28, 1988, 8817978; Jul. 28, 1988, 8817979

Int. Cl.[5] H04N *11/22, 9/64*

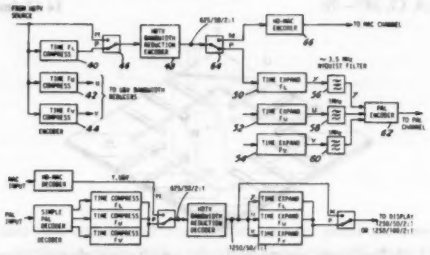
U.S. Cl. 358—21 R **23 Claims**

1. A method of receiving high definition television signals transmitted in a first signal format, comprising:

receiving the signals and decoding with a first decoder compatible with the first signal format to provide first decoded luminance and chrominance components;

time compressing the decoded luminance and chrominance components under the control of a control signal which determines the degree of time compression;

decoding the time compressed signals with a second decoder compatible with the time compressed signal to provide decoded time compressed signals;



time expanding the decoded time compressed signals under the control of the control signal, the control signal determining a degree of time expansion substantially equal to the degree of time compression; and

displaying or recording the information conveyed by the time expanded signals.

5,010,393

METHOD AND APPARATUS FOR ADJUSTING CHROMA

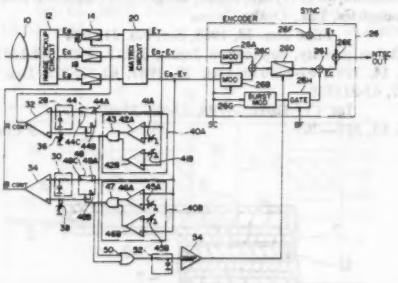
Kenji Saito, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 27, 1989, Ser. No. 385,449

Claims priority, application Japan, Aug. 30, 1988, 63-216105

Int. Cl.[5] H04N *9/64*

U.S. Cl. 358—29 **20 Claims**



1. An apparatus for adjusting chroma comprising:

image pickup means, coupled to image signals of a desired scene, for converting said image signals to red, green, and blue color signals;

color signal amplifier means, coupled to said image pickup means, for amplifying said red, green, and blue color signals;

matrix means, coupled to said color signal amplifier means, for converting said amplified red, green and blue color signals to a brightness signal and first and second color difference signals;

video signal producing means, coupled to said matrix means, for combining said first and second color difference signals to produce a chroma signal and for amplifying said chroma signal in a chroma amplifier to provide as output an amplified chroma signals;

strong color difference signal detection means, coupled to said matrix means, for detecting when both of said first and second color difference signals exceed a predeter-

mined range of acceptable levels and for outputting strong color difference signals indicative thereof; and

chroma information detecting means, coupled to said strong color difference signal detection means, for combining said strong color difference signals and for outputting a chroma indicative signal of a level corresponding to the level of high chroma colors present in said desired scene,

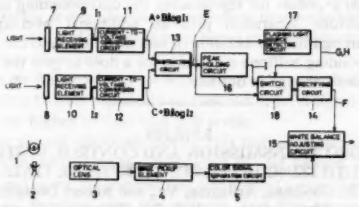
said chroma amplifier controlled in response to said chroma indicative signal to have a normal chroma gain level when said level of high chroma colors is high and to have a high chroma gain level when said level of high chroma colors is low.

5,010,394

AUTOMATIC WHITE BALANCE CIRCUIT CAPABLE OF EFFECTIVELY ADJUSTING WHITE BALANCE UNDER A FLASHING LIGHT SOURCE

Fumihide Murao, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 1, 1989, Ser. No. 387,999
Claims priority, application Japan, Jan. 18, 1989, 1-9016
Int. Cl.[5] H04N *9/73 C*
U.S. Cl. 358—29 **10 Claims**



1. An automatic white balance circuit contained in an image pickup apparatus for automatically adjusting white balance when there is a change in ratios between respective color components included in light applied from a light source to an object picked up by said image pickup apparatus, said automatic white balance circuit comprising:

ratio signal generating means for receiving said light from said light source to generate and output a ratio signal indicating a ratio between prescribed two of said color components included in said light;

a holding circuit connected to said ratio signal generating means for holding and outputting said ratio signal corresponding to a maximum value of illuminance of said light applied from said light source to said object;

a flashing light source detecting circuit for detecting a number of flashing times of said light source to output a first signal when said number of flashing times exceeds a prescribed number while outputting a second signal when the former is less than the latter;

a switch circuit connected to said ratio signal generating means, said holding circuit and said flashing light source detecting circuit for outputting an output of said holding circuit in response to said first signal from said flashing light source detecting circuit while outputting an output from said ratio signal generating means in response to said second signal; and

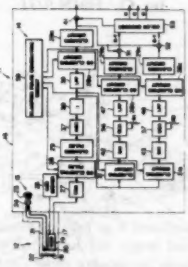
a white balance adjusting circuit for adjusting white balance in accordance with an output from said switch circuit.

5,010,395

SOLID STATE IMAGING APPARATUS

Kiyoshi Tsuji, Tanashi, and Kenji Kimura, Tachikawa, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Mar. 13, 1989, Ser. No. 322,038
Claims priority, application Japan, Apr. 20, 1988, 63-98840; May 25, 1988, 63-129238
Int. Cl.[5] A61B *1/04;* **H04N** *5/18*
U.S. Cl. 358—44 **5 Claims**



1. A solid state imaging apparatus comprising:

an imaging means having a solid state imaging device for photoelectrically converting an object image and outputting a picture image signal;

a signal processing means connected with said imaging means, for processing said picture image signal obtained by said solid state imaging device and outputting a video signal;

a gain adjusting means provided in said signal processing means for receiving the photoelectrically converted output of said solid state imaging device and variably controlling the gain; and

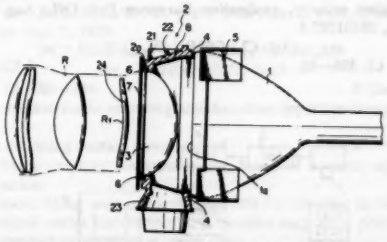
a direct current-clamping means connected to receive an output from said gain adjusting means for direct current-clamping an optical black part included in the output signal of said solid state imaging device and stabilizing the black level of said video signal.

5,010,396

TELEVISION PROJECTOR FOR PROJECTION DISPLAY

Masaaki Hanyu, and Yukio Ozaki, both of Tokyo, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Apr. 26, 1990, Ser. No. 514,803
Claims priority, application Japan, Jul. 31, 1989, 1-196927
Int. Cl.[5] H04N *9/31*
U.S. Cl. 358—60 **6 Claims**



1. A TV projector for a three-tube projection display which projects a red picture, a green picture and a blue picture by three projection TV CRTs through three projection lenses disposed in front of the three projection TV CRTs, respectively, wherein a component lens of at least one of the projection lenses of the TV projector contains a light-absorbing

substance capable of absorbing light components of the corresponding color picture in a sideband of the spectrum of the color picture.

5,010,397

TRIPLE TUBE TYPE PROJECTION TELEVISION

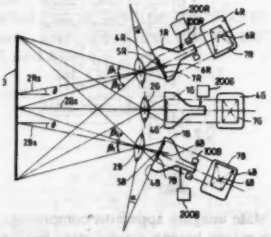
Shinichi Hasegawa, Tokyo, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jul. 3, 1989, Ser. No. 374,699

Claims priority, application Japan, Oct. 26, 1988, 63-268308

Int. Cl.[5] H04N 9/31

U.S. Cl. 358—60 **4 Claims**



1. A triple tube type projection television for projecting images from blue, green and red projecting tubes onto a screen by lenses disposed in front of the respective projecting tubes and synthesizing the images from said three projecting tubes on the screen to provide a color image, wherein:

intersection points between the screen and respective ones of the optical axes of lenses on both sides of a central lens are offset outwardly from the intersection point between the screen and the optical axis of the central lens;

tube centers of the projecting tubes on said both sides are dislocated outwardly from the optical axes of the lenses therefor;

said triple tube type projection television comprising:

cooling means coupled to said projecting tubes in order to proved adequate cooling thereof; and

means for applying an external magnetic field to said projecting tubes in order to supplementally adjust the images on the screen.

5,010,398

METHOD FOR COLOUR CORRECTION BY DRY DOT ETCHING USING PHOTOGRAPHICALLY PRODUCED MASK

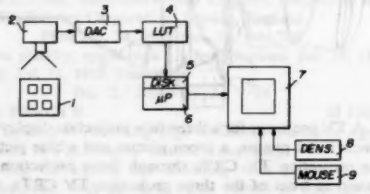
Pierre H. Nys, Berchem; Paul W. Vinck, Hove, both of Belgium, and Andreas von Erdmannsdorff, Monheim, Fed. Rep. of Germany, assignors to AGFA-Gevaert, N.V., Mortsel, Belgium

Filed Jun. 29, 1989, Ser. No. 372,844

Claims priority, application European Pat. Off., Aug. 23, 1988, 88201787.4

Int. Cl.[5] G03F 3/08, 3/10

U.S. Cl. 358—80 **5 Claims**



1. A method of producing dot-size corrected or modified halftone colour separations of an image for use in making a printing plate for printing reproductions of said image, which method comprises the steps of scanning each of said halftone separations separately to produce an electrical signal representing the same and digitizing said signals,

storing said digitized values into a digital storage device,

visualising from said digitized values on an image display device an image representative of at least one of said halftone separations,

defining on said displayed image and by means of said stored values at least one area to be corrected,

calculating by means of a microprocessor to which said stored values are applied at least one combination of halftone colour separation positives and/or negatives of said image that when exposed in overlaying relation on a photographic film yields a mask for isolating each such area to be corrected,

visualising and evaluating the resultant mask alone or in superposition with at least one of said halftone separations on said image display device,

redefining said area to be corrected in accordance with the result of said evaluation and recalculating a mask therefor by means of the stored data or by means of data pertaining to the previously calculated mask and visualising said recalculated mask for further evaluation as an acceptable final mask,

photographically producing said recalculated mask for isolating said area to be corrected,

determining the percentage dot size correction (increase or decrease) that is required, and

exposing and processing light-sensitive print material to produce a print exhibiting the required percentage dot-size correction by subjecting said print material to a normal exposure for reproducing the corresponding original halftone separation plus an additional overexposure through the combination of said final mask and the corresponding halftone separation for a dose to give the determined change in dot size.

5,010,399

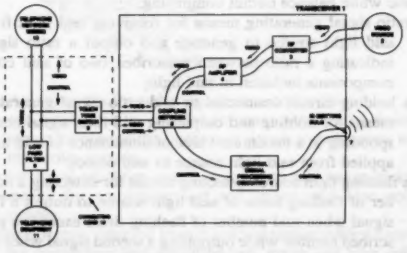
VIDEO TRANSMISSION AND CONTROL SYSTEM UTILIZING INTERNAL TELEPHONE LINES

David D. Goodman, Arlington, Va., and Robert Domnitz, Lexington, Mass., assignors to Inline Connection Corporation, Arlington, Va.

Filed Jul. 14, 1989, Ser. No. 379,751

Int. Cl.[5] H04N 7/12

U.S. Cl. 358—85 **30 Claims**



2. A communications system that includes a network of wiring, a plurality of ports ordinarily used for connection of telephone equipment to said network, and an interface to a telephone system, said ports being located in different areas, said network comprising a plurality of 2-wire conductive paths connecting said ports to said interface, the communications system including a first one of said ports and a first electronic device (1) located in a first area, and a second one of said ports and a second electronic device (15) located in a second area, the system further including an apparatus (2) located in said

first area, said apparatus responding to infrared light signals received from an infrared light transmitter for determining operational modes of said apparatus, said apparatus being out of range of said light transmitter when said light transmitter is located in the second area, wherein:

(a) said second electronic device (15) further includes:

first converting means for converting infrared light radiation to a first series of electrical impulses,

first representing means for representing said first series of electrical impulses as a second series of electrical impulses, information content of said second series being substantially the same as the information content of said first series, substantially all of the energy of said second series being concentrated at frequencies above the highest frequency used for communication by ordinary telephone devices, wherein said first representing means includes:

means for creating a weighted average signal, said weighted average signal being a weighted average of the energy level of said first series of electrical impulses over a preceding time period of predetermined length,

means for creating a first bi-level signal, said first bi-level signal assuming a high state when the energy level of said first series of electrical impulses exceeds said weighted average signal, said first bi-level signal otherwise assuming a low state,

means for suppressing noise by creating a second bi-level signal, said second bi-level signal assuming a high state whenever the energy level of said first series of electrical impulses exceeds said weighted average by a fixed factor at any time over a preceding time period of fixed length, said second bi-level signal otherwise assuming a low state, and

means for providing an RF carrier only when both said first bi-level signal and said second bi-level signal are at the higher of their two said levels;

said second electronic device (15) further including first transmitting means, connected to said second one of said ports, for transmitting said second series of electrical impulses onto the network, said first transmitting means comprising first filtering means for presenting a high impedance to signals whose energy is concentrated at frequencies below the highest frequency used for communication by ordinary telephone devices, while allowing said second series of electrical impulses to transmit substantially unchanged, and wherein

(b) said first electronic device (1) further includes:

first recovering means, connected to said first one of said ports, for recovering said second series of electrical impulses from the network wiring, said first recovering means comprising second filtering means for presenting a high impedance to signals whose energy is concentrated at frequencies below the highest frequency used for communication by ordinary telephone devices, while allowing said second series of electrical impulses to transmit substantially unchanged,

second representing means for representing said second series of electrical impulses as a third series of electrical impulses, information content of said third series being substantially the same as the information content of said second series, and

second converting means for converting said third series of electrical impulses to infrared light radiation, said second converting means creating a light pattern with substantially the same characteristics as the light pattern created by the infrared light radiation in the second area.

5,010,400

TELEVISION TUNER FOR RECEIVING MULTIPLE BAND TELEVISION SIGNALS

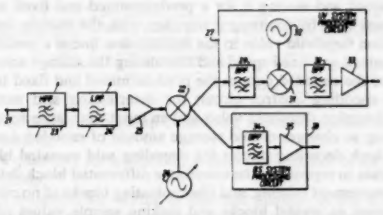
Hideki Oto, Saitama, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Aug. 2, 1989, Ser. No. 388,493

Claims priority, application Japan, Aug. 3, 1988, 63-193998

Int. Cl.[5] H04N 1/00, 7/10

U.S. Cl. 358—86 **7 Claims**



1. A television tuner for use in a television receiver to receive a VHF signal band, a UHF signal band, and a satellite signal band converted from a received satellite signal, all of which are provided as a combined signal by a

an input means to receive the combined signal from the signal combiner;

first oscillator having variable frequency;

first mixer means to receive the combined signal and the output of the first oscillator means to convert the combined signal into a first intermediate frequency signal if the VHF and UHF signals are to be utilized by the television receiver or a second intermediate frequency signal if the satellite signal is to be utilized by the television receiver;

first and second band-pass filter means connected to the first mixer means to receive first and second intermediate frequency signals, wherein the first band-pass filter means is designed to pass the first intermediate frequency signal and the second band-pass filter means is designed to pass the second intermediate frequency signal; and

means for processing the signals passed by the first and second band-pass filter means to provide a standard VHF and UHF television signals and a frequency modulated satellite signal.

5,010,401

PICTURE CODING AND DECODING APPARATUS USING VECTOR QUANTIZATION

Tokumichi Murakami; Kohtaro Asai; Koh Kamizawa; Masami Nishida, all of Kamakura; Eizo Yamazaki, Tokyo; Atsushi Itoh, Yokohama, and Naoto Kinjoh, Kamakura, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP88/00796, § 371 Date Apr. 7, 1989, § 102(e) Date Apr. 7, 1989

PCT Filed Aug. 11, 1988, Ser. No. 340,009

Int. Cl.[5] H04N 7/12, 7/18

U.S. Cl. 358—136 **8 Claims**

1. An interframe encoding and decoding apparatus comprising:

an encoding section composed of

a frame memory for storing one frame of a video signal series;

a raster/block scan converting circuit for dividing an input signal series into blocks of k samples each (k: a positive integer) to form input block data;

a subtractor for obtaining interframe differential block data by subtracting block data stored in said frame memory from said input block data, corresponding to the same position as that of the input block data in the period of at least one frame before;

a motion detecting circuit for comparing an absolute value

sum of amplitudes of samples within the block of said interframe differential block data with a motion detection threshold value, and detecting motion in units of block and determining motion information of movement existing when said sum is greater than said threshold value and no movement when said sum is less than said threshold value;

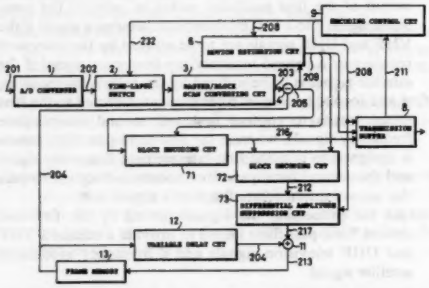
a block encoding circuit for encoding the interframe differential block data of movement existing as valid blocks into encoded block data;

a transmission data buffer for converting the motion information and the encoded block data into a suitable code word and storing it for a predetermined and fixed time, and then transmitting it together with the motion detection threshold value to the transmission line at a predetermined and fixed speed and calculating the storage amount of the encoded data in the predetermined and fixed time;

an encoding control circuit for determining said motion detection threshold value and an input time lapse according to changes of said storage amount of encoded data;

a block decoding circuit for decoding said encoded block data to reproduce the interframe differential block data of movement existing, and discriminating blocks of no movement as invalid blocks and making sample values of an interframe differential decoded block data corresponding to an invalid block all zero;

a differential amplitude suppressing circuit for suppressing the amplitude value of the decoded interframe differential block data obtained in said block decoding circuit non-linearly based on said motion detection threshold value; and



an adder for adding the suppressed decoded interframe differential block data to said block data in the frame memory and obtaining reproduction block data, and replacing block data in said frame memory with reproduction block data of the same position in a frame as that of the block data in the frame memory; and

a decoding section composed of

a reception data buffer memory for receiving the encoded data supplied through the transmission line and storing it for a predetermined and fixed time, and then decoding the motion information and the encoded block data from the code word and separating and outputting the motion detection threshold value;

a block decoding circuit for decoding and reproducing the interframe differential block data of movement existing from said encoded block data from said reception buffer memory, and discriminating the block of no movement as an invalid block and making sample values of the reproduced interframe differential block data corresponding to an invalid block all zero;

a differential amplitude suppressing circuit for suppressing the amplitude value of the decoded interframe differential block data obtained in said block decoding circuit non-linearly based on the motion detection threshold value;

a frame memory for storing one frame of a video signal series in blocks;

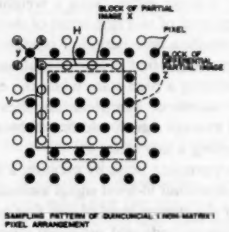
an adder for adding the suppressed interframe differential decode block data to the block data from said frame memory and obtaining reproduction block data, and writing the reproduction block data at the same position as that of the block data within said frame memory; and a block-/raster scan converting circuit for converting the reproduction block data from said adder into a signal series in raster form.

5,010,402

VIDEO SIGNAL COMPRESSION APPARATUS

Masakazu Nishino, Kashiwara, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 17, 1990, Ser. No. 524,741
Int. Cl.[5] H04N 7/133
U.S. Cl. 358—138 **6 Claims**



1. A video signal compression apparatus comprising:

a separation circuit for receiving a video signal having a non-matrix pixel arrangement and separating the received signal into a plurality of partial images each having a matrix pixel arrangement;

an interpolation circuit for producing from a predetermined partial image of the plurality of partial images an interpolated partial image for pixel positions of a remaining partial image of them;

a subtractor circuit for producing a differential partial image from the difference between the remaining partial image and the interpolated partial image;

an orthogonal transformation and coding circuit for converting the predetermined partial image into a plurality of blocks and coding them by an orthogonal transformation;

a coding circuit for converting the differential partial image into plural blocks to code them;

a code length estimate circuit for determining a code length of a coded output of the coding circuit; and

a code length assignment circuit for assigning a code length of a coded output of the orthogonal transformation and coding circuit adaptively by a code length output determined by the code length estimate circuit.

5,010,403

MEASUREMENT OF TIMEBASE JITTER FOR COMPONENT VIDEO

Edward D. Wardzala, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

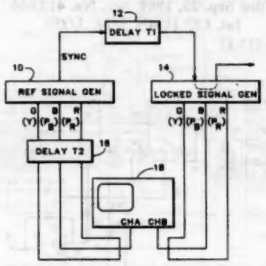
Filed Apr. 12, 1990, Ser. No. 507,817
Int. Cl.[5] H04N 17/00
U.S. Cl. 358—139 **12 Claims**

1. A method of measuring timebase jitter comprising the steps of:

generating a test signal from a reference signal generator and

from a local signal generator the two test signals being identical;

adjusting the timing between the two test signals; and



processing the test signals together to provide a display of the timebase jitter.

5,010,404

CHARACTERISTICS CORRECTOR

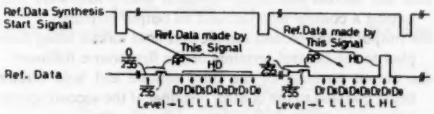
Yoshiyuki Sasaki; Kenji Tsunashima; Ikuo Ookuma, and Toshifumi Fujii, all of Nagaokakyo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 13, 1988, Ser. No. 283,981

Claims priority, application Japan, Dec. 14, 1987, 62-315597; Jun. 30, 1988, 63-164540; Jul. 22, 1988, 63-184247

Int. Cl.[5] H04N *17/00*

U.S. Cl. 358—139 **10 Claims**



1. A characteristics corrector in a video signal processing system for correcting characteristics of the video signal processing system at the time of recording and/or reproducing a video signal, the corrector comprising:

reference pulse generating means for generating reference pulses of varying amplitudes corresponding to plural gradations from a black level to a white level of a video signal to be recorded, the reference pulses, each being of a single non-varying amplitude and being recorded during a blanking period of the video signal;

pulse amplitude data generating means for generating quantified data used for amplitude discrimination of the reference pulses;

reference data interleaving means for interleaving, as reference data, the reference pulses and corresponding pulse amplitude data indicative of the amplitudes thereof during the blanking period; and

level correcting means for correcting the level of a reproduced video signal by utilization of a plurality of reference pulses and corresponding pulse amplitude data obtained from the reproduced video signal.

5,010,405

RECEIVER-COMPATIBLE ENHANCED DEFINITION TELEVISION SYSTEM

William F. Schreiber, Cambridge; Andrew B. Lippman, Salem; Edward H. Adelson, Cambridge, all of Mass., and Aran N. Netravali, Westfield, N.J., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

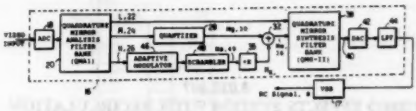
Filed Feb. 2, 1989, Ser. No. 305,796

Int. Cl.[5] H04N *7/04*

U.S. Cl. 358—141 **29 Claims**

1. A television encoder for generating a receiver-compatible signal from a production video signal containing enhancement information which cannot be displayed on a standard receiver, the receiver-compatible signal being compatible with the standard receiver, the encoder comprising:

a. a filter bank for dividing the video signal into at least two groups of spatial frequency components including a first group and a second group, the first group containing members which when combined together form a standard video signal which is displayed by the standard receiver



and the second group containing the enhancement information;

b. a quantizer for quantizing at least one member of the first group;

c. a combiner for adding at least one member of the second group to a quantized member of the first group to produce a modified first group; and

d. a synthesizer for combining the members of the modified first group to generate the receiver-compatible signal.

5,010,406

APPARATUS FOR RECEIVING CHARACTER MULTIPLEX BROADCASTING

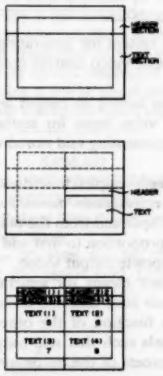
Toshikatsu Kawakami, Mishima; Shin Fukuda, Hirakata; Hiroyasu Shinbo, Toyonaka; Toyoaki Unemura, itami; Ken Sakamoto, Takatsuki, and Tomoji Kondo, Takatsuki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 19, 1989, Ser. No. 354,241

Claims priority, application Japan, May 25, 1988, 63-127733

Int. Cl.[5] H04N *7/087*

U.S. Cl. 358—147 **3 Claims**



1. A character multiplex broadcasting receiving apparatus comprising:

means for receiving, storing, and displaying character signals representing character images which were multiplexed for a vertical blanking period of a television signal including information representing a television image;

division signal generating means, receiving a horizontal pulse, a vertical pulse and a clock signal, for generating division signals, said division signals being employed in the reduction of a picture plane to be received and displayed and in the simultaneous display of images in a plurality of divided picture planes in a display screen

based on said horizontal pulse, said vertical pulse, and said clock signal; and

selection signal generating means for selecting either said television image or one of said character images for each of said divided picture planes.

5,010,407

VIDEO EFFECTS SYSTEM WITH RECIRCULATION VIDEO COMBINE AND OUTPUT COMBINE

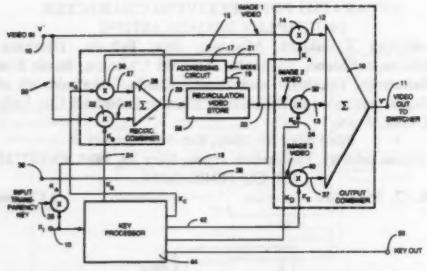
David E. Trytko, Foster City, Calif., assignor to Ampex Corporation, Redwood City, Calif.

PCT No. PCT/US88/01031, § 371 Date Nov. 11, 1988, § 102(e) Date Nov. 11, 1988, PCT Pub. No. WO88/07801, PCT Pub. Date Oct. 6, 1988

Continuation of Ser. No. 32,155, Mar. 27, 1987, abandoned. This PCT application Mar. 25, 1988, Ser. No. 333,201

Int. Cl.[5] H04N *5/262, 9/74, 5/14, 5/53*

U.S. Cl. 358—183 26 Claims



1. A video effects system for generating composite output video from one or more video sources comprising:

a video input;

recirculation means having an output and having an input coupled to said video input for storing video from said video input and presenting said stored video at said output at a later time;

output combine means coupled to said video input and to the output of said recirculation means for combining video from said video input and from the output of said recirculation means in proportion to first and second key signals to generate composite output video;

a first key processor means for generating said first and second key signals such that one of said first and second key signals is a function of the other of said first and second key signals such that said output video does not have a gain in excess of the maximum available gain resource;

wherein said recirculation means includes means to couple a recirculated video from said output back into the input of said recirculation means to alter a gain of said recirculated video in accordance with a third key signal and to combine said recirculated video with video from said video input; and

further comprising second key processor means for generating said third key signal as a function of a fourth key signal such that the combined video stored in said recirculation means does not have a gain greater than a maximum available gain resource.

5,010,408

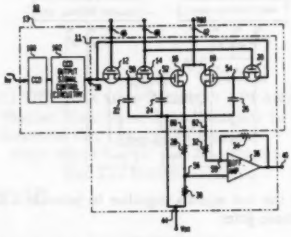
DOUBLY CORRELATED SAMPLE AND HOLD CIRCUIT

William J. Toohey, Pittsford, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 25, 1989, Ser. No. 412,064

Int. Cl.[5] H04N *3/14, 5/335*

U.S. Cl. 358—213.11 26 Claims



1. Circuitry comprising:

first, second and third sample and hold circuits each having a control terminal, an input terminal and an output terminal;

the input terminals of the first and second sample and hold circuits being coupled together to a circuitry input terminal;

the output terminal of the first sample and hold circuit being coupled to the input of the third sample and hold circuit;

the second and third sample and hold circuits being essentially identical;

first and second essentially identical source followers each having a control terminal and an output terminal;

the output of the second sample and hold circuit being coupled to the control terminal of the first source follower;

the output terminal of the third sample and hold circuit being coupled to the control terminal of the second source follower;

subtraction means, which has a first input coupled to the output of the first source follower, has a second input coupled to the output of the second source follower and has an output coupled to a circuitry output terminal, for during operation of the circuitry subtracting signals appearing on the outputs of the source followers from each other to generate an output signal which is the difference between signals appearing on the output terminals of the source followers; and

the sample and hold circuits an the source followers being formed on a common semiconductor body which does not include the subtraction means.

5,010,409

IMAGE SENSING SYSTEM

Tokuji Ishida; Toshio Norita, and Jun Hasegawa, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 141,080, Jan. 5, 1988. This application Nov. 16, 1989, Ser. No. 437,526

Claims priority, application Japan, Jan. 6, 1987, 62-950; Mar. 18, 1987, 62-63459

Int. Cl.[5] H04N *3/14*

U.S. Cl. 358—213.19 4 Claims

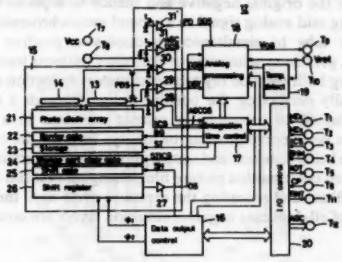
1. An image sensing device comprising:

reference voltage generating means for generating a reference voltage;

an image sensor for receiving light from an object and for outputting an electric signal;

A/D converting means for converting an analog signal into a digital signal, a dynamic range of said A/D converting means being limited to the reference voltage; and

voltage adjusting means for adjusting the electric signal from said image sensor based on the dynamic range of said



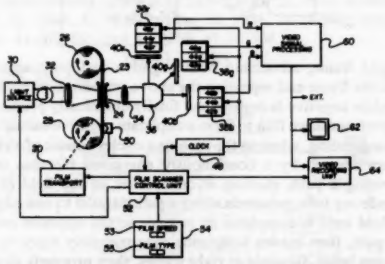
A/D converting means and transferring the adjusted signal to said A/D converting means.

5,010,410

METHOD AND APPARATUS FOR SIGNAL COMPANDING

Lawrence J. Bernstein, Honeoye Falls, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 16, 1989, Ser. No. 422,348
Int. Cl.[5] H04N *3/36, 5/253*
U.S. Cl. 358—214 **6 Claims**



3. An apparatus comprising:

a. transport means for transporting film through a film gate;

b. illumination means for passing light through said film gate and focusing said light onto at least one light sensitive device that generates an output light signal;

c. selection means for selecting the type of film to be transported through said film gate by said transport means and generating a film type signal indicative thereof;

d. companding means for receiving said output light signal and said film type signal, and generating an output signal having a transfer curve that corresponds to said film type signal wherein said companding means includes a summing circuit, a logarithmic amplifier coupled to said summing circuit, and a feedback circuit coupled to said summing circuit and an output of said logarithmic amplifier, and wherein said feedback circuit includes a compression ratio adjustment circuit that generates a reference signal corresponding to a selected transfer curve in response to said film type signal; and

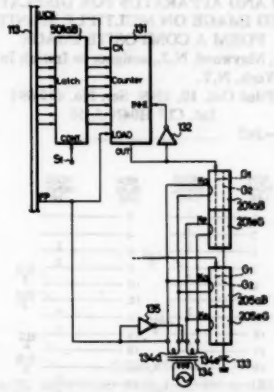
e. processing means for receiving said output signal generated by said companding means and producing a video output signal.

5,010,411

VIDEO DISPLAY SYSTEM

Satoshi Shimada, Kanagawa, and Yuji Watanabe, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jan. 30, 1986, Ser. No. 824,236
Claims priority, application Japan, Jan. 31, 1985, 60-017129
Int. Cl.[5] H04N *5/66*
U.S. Cl. 358—230 **4 Claims**



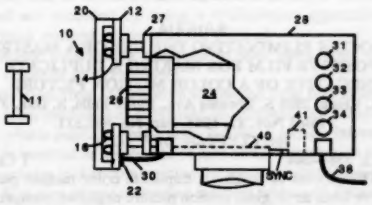
1. A video display system comprising: a video signal source for supplying a video signal; a plurality of display cells arranged in rows and columns in an X-Y matrix form; and a plurality of driving circuits for driving said plurality of display cells in response to said video signal, characterized in that each of said driving circuits is provided to commonly drive a plurality of said display cells adjacent to each other in the column direction, and switching means provided for switchably activating different ones of said plurality of said display cells cyclically at a field rate of said video signal, wherein said plurality of the display cells adjacent to each other are two neighboring display cells in the column direction, and wherein each of said driving circuits includes a scanning converter for doubling the vertical frequency of said video signal; and a pulse width modulation circuit responsive to said converted video signal for deriving a PWM signal corresponding to the brightness level of said converted video signal.

5,010,412

HIGH FREQUENCY, LOW POWER LIGHT SOURCE FOR VIDEO CAMERA

Gregory M. Garriss, Federal Way, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Dec. 27, 1988, Ser. No. 290,581
Int. Cl.[5] H04N *3/12, 7/18*
U.S. Cl. 358—240 **13 Claims**



1. A light source for providing illumination of an object, said light source comprising:

a diode for emitting light when energized;

means for periodically energizing said diode with an adjustable frequency and duty cycle such that said diode emits a sequence of light flashes illuminating said object; and

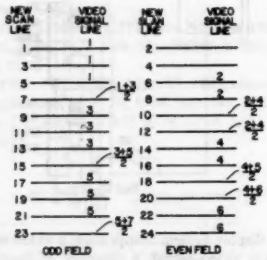
enabling means for selectively enabling and disabling said means for periodically energizing said diode, said enabling means being operatively responsive to a synchronization signal.

5,010,413

METHOD AND APPARATUS FOR DISPLAYING AN ENLARGED IMAGE ON MULTIPLE MONITORS TO FORM A COMPOSITE IMAGE

Edward Bahr, Maywood, N.J., assignor to Imtech International, Inc., New York, N.Y.

Filed Oct. 10, 1989, Ser. No. 419,094
Int. Cl.[5] H04N *5/68*
U.S. Cl. 358—242 **11 Claims**



1. A method for displaying an image from video signals, comprising the steps of:

generating video signals indicative of an interlaced image, said video signals containing video field data in two interlaced fields, each of said fields comprising successively occurring video line data;

enlarging the image by replicating the video line data;

determining where replications of the video line data of each of the interlaced fields would result in distortion between the two interlaced fields;

providing a selected combination of video line data in place of the replications which would result in said distortion; and

displaying the enlarged image on a plurality of monitors each having successively occurring scan lines so that each of the monitors displays at most a respective portion of the enlarged image which is less than an entirety of the enlarged image and so that a composite of each portion displayed on the monitors together constitute the enlarged image, the step of displaying including interlacing the successively occurring scan lines for each respective one of said monitors, forming display signals for the video line data including that which was replicated and that which was provided, and correlating said display signals with said scan lines for the monitors so that each monitor will display only the respective portion of the enlarged image.

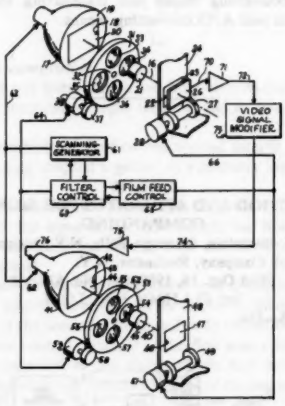
5,010,414

PROCESS ELIMINATING THE USE OF A MASTER POSITIVE FILM FOR MAKING A DUPLICATE NEGATIVE OF A COLOR MOTION PICTURE

Roy A. Clapp, 2505 S. Kiwanis Ave., Sioux Falls, S. Dak. 57105

Filed Nov. 27, 1985, Ser. No. 802,511
Int. Cl.[5] H04N *5/87, 5/253*
U.S. Cl. 358—244 **7 Claims**

1. The process of making a duplicate color motion picture negative from an original motion picture negative, comprising, an exposure cycle including the steps of generating an analog electrical signal corresponding to a single dye layer of a frame of the original color motion picture negative by projecting one or more scanning cycles of a continuous raster pattern formed upon a first monochromatic cathode ray tube, through a first optical filter restricting the light energy to a predetermined wave length band, focusing said raster pattern on a single frame of the original negative and thence to a photo sensor, supplying said analog signal to a second monochromatic cathode ray tube to simultaneously display a positive image thereon, precise synchronism of the raster patterns insured by providing both cathode ray tubes a common deflection source, and finally projecting the positive image through a second filter adapted to substantially restrict exposure to a single emulsion layer corresponding to the dye layer of the original negative being scanned, and onto a photosensitive surface of an unexposed color motion picture film; changing first and second optical filters and repeating the exposure cycle until the latent images of all duplicate negative emulsion layers are completed



for said frame; advancing both negative and photosensitive films one frame and repeating the above process steps until the complete negative is copied; and finally chemically processing the photosensitive film to form a duplicate negative suitable for release printing, wherein the scanning cycles consist of a raster pattern formed by a continuously energized electron beam traversing a path, starting at one corner of the field of the cathode ray tube, proceeds along a path parallel to one edge of the field until it completes its passage to the opposite end of said path, then moves a distance approximately equal to the electron beam diameter at right angles, then proceeds along a path parallel to its previous movement, repeating this pattern until the complete field has been covered, whereupon the beam retraces the foregoing pattern in a reverse direction to return to its starting point.

5,010,415

IMAGE FORMING APPARATUS HAVING SWITCHABLE COLOR SEPARATION FILTER UNITS

Makoto Suzuki, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Japan

Filed Aug. 21, 1990, Ser. No. 570,545
Claims priority, application Japan, Aug. 24, 1989, 1-217822
Int. Cl.[5] G03F *3/06*; H04N *1/29*; G01D *15/14*
U.S. Cl. 358—302 **6 Claims**

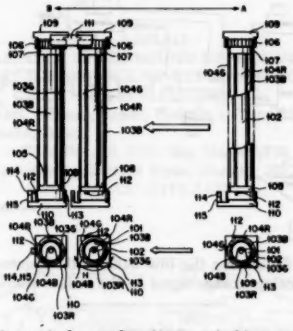
1. An image forming apparatus for forming a mask member on the basis of a color image information and exposing a photosensitive recording medium to light through the mask member to thereby forming a color image, including:

a light source for emitting light;

at least two color separation filter units for passing the light therethrough and providing transmitted lights having different half-widths in wavelength to thereby. irradiate

the light having a desired half-width in wavelength to the photosensitive recording medium;

a position detecting unit for detecting each position of said color separation filter units; and



a switching unit for performing a switching operation between said color separation filter units to position desired one of said color separation filter units in an optical path of the light.

5,010,416

COLOR VIDEO SIGNAL REPRODUCING APPARATUS

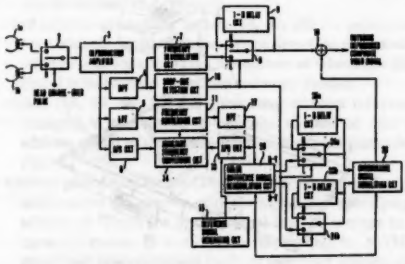
Hiroto Yasumura; Masahide Hirasawa; Minoru Noji, all of Kanagawa, Japan; Susumu Kozuki, Tokyo; Koji Takahashi, and Katsuji Yoshimura, both of Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 39,085, Apr. 16, 1987, Pat. No. 4,896,219. This application Oct. 11, 1989, Ser. No. 420,764

Claims priority, application Japan, Apr. 23, 1986, 61-093978; Apr. 23, 1986, 61-093979; May 12, 1986, 61-107983; May 12, 1986, 61-107984; May 12, 1986, 61-107986

Int. Cl.[5] H04N *9/88*

U.S. Cl. 358—314 **4 Claims**



1. A video signal reproducing apparatus for reproducing a composite video signal from a record bearing medium on which the composite video signal is recorded, said composite video signal being formed, from a color video signal including at least a luminance signal and a chrominance signal, by frequency-modulating said luminance signal, frequency-converting said chrominance signal into a signal having a lower frequency band than its original frequency band and then frequency-multiplexing the both signals, comprising:

(a) reproducing means for reproducing said composite video signal from said record bearing medium;

(b) separating means for separating the frequency-modulated luminance signal and the frequency-converted chrominance signal from said composite video signal reproduced by said reproducing means outputting the separated signals, respectively;

(c) demodulating means for demodulating the frequency-converted chrominance signal outputted from said separating means into a plurality of different base-band signals and for outputting these signals, respectively; and

(d) drop-out compensating means for applying drop-out compensation to said plurality of different base-band signals outputted from said demodulating means.

5,010,417

PLAYBACK METHOD FOR USE IN A RECORDING MEDIUM PLAYING APPARATUS USING INFORMATION CONTROL SIGNALS

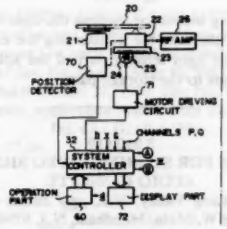
Junichi Yoshio; Sumio Hosaka; Hisao Matsuoka; Youichirou Tsuda; Shoichi Katagiri, all of Tokorozawa, and Satoru Nomura, Yamanashi, all of Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Dec. 21, 1988, Ser. No. 287,148

Claims priority, application Japan, Apr. 25, 1988, 63-102177

Int. Cl.[5] H04N *5/76*

U.S. Cl. 358—335 **5 Claims**



1. A playback method for use in an apparatus for playing a recording medium having an index code area, a first area in which only an audio information signal is recorded, and a second area in which a video signal and an audio information signal are recorded by using a multiplexing operation, said playback method comprising the steps of:

reading information recorded in said index code area in response to a command;

detecting, from information recovered from said index code area, information indicating the presence of picture data which indicates that a code including picture information is inserted as a subcode of said audio information signal;

moving a pickup to a position for reading information of said first area of said recording medium when said information indicating the presence of picture data is detected; and

reproducing information of said first area in priority to reproducing information of other areas of said recording medium.

5,010,418

IMAGE PICK-UP DEVICE

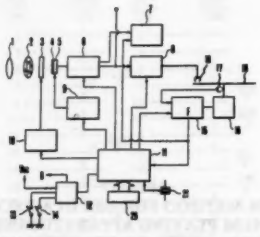
Takao Kinoshita, Tokyo; Akihiko Tojo, Kanagawa; Tsutomu Takayama, Kanagawa; Toshio Kaji, Kanagawa, and Nobuyoshi Tanaka, Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 274,703, Nov. 15, 1988, Pat. No. 4,910,606, which is a continuation of Ser. No. 195,492, May 18, 1988, abandoned, which is a continuation of Ser. No. 860,513, May 7, 1986, Pat. No. 4,783,204, which is a continuation of Ser. No. 452,500, Dec. 23, 1982, Pat. No. 4,599,657. This application Jan. 2, 1990, Ser. No. 459,564

Claims priority, application Japan, Dec. 29, 1981, 56-215333; Dec. 29, 1981, 56-215337; Dec. 29, 1981, 56-215342; Dec. 29, 1981, 56-215343; Dec. 29, 1981, 56-215344; Dec. 29, 1981, 56-215345

Int. Cl.[5] H04N *5/76*

U.S. Cl. 358—335 8 Claims



1. An image pick up device comprising:

(a) charge-transferable solid-state image pick-up means, having a light sensing part and a shaded storage part, said light sensing part having a photoelectric transducing ability and capable of holding temporarily an electrical image information formed in the light sensing part by transferring it to the storage part;

(b) control means for controlling the transfer of the electrical image information in the solid-state image pick-up means; and

(c) light shading means for shading the light sensing part at least during the time for transferring the electrical information in the light sensing part of the solid-state image pick-up means to the storage part.

5,010,419

APPARATUS FOR STORING VIDEO SIGNALS ON AUDIO CASSETTE

Thomas Heidt, Long Valley, N.J., and James C. Wickstead, Pitney Rd. and W. Main, Mendham, N.J. 07945, assignors to James C. Wickstead, Mendham, N.J.

Continuation of Ser. No. 938,087, Dec. 4, 1986, Pat. No. 4,875,107. This application Jul. 23, 1989, Ser. No. 378,749

Int. Cl.[5] H04N *5/782*

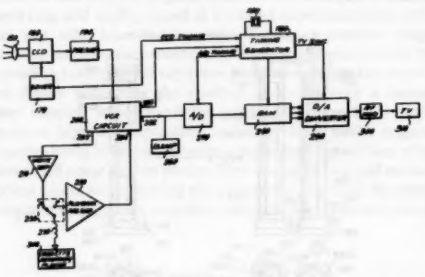
U.S. Cl. 358—335 19 Claims

1. A video apparatus for storing video images on a recording medium comprising:

camera means for converting light images into electrical video signals;

processing means coupled to the camera means including means for converting the electronic video signal into a low bandwidth frequency modulated analog storage signal with a bandwidth substantially lower than a standard television video signal; and

recording means coupled to the processing means for storing the low bandwidth frequency modulated analog storage signal on an audio cassette having a standard speed allowing storage of an audio bandwidth signal, the recording means including drive means for driving the audio cassette at higher than normal speed to increase the bandwidth storage capacity of the audio cassette and recording head



means for storing the low bandwidth frequency modulated analog storage signal on the audio cassette.

5,010,420

IMAGE PROCESSING APPARATUS

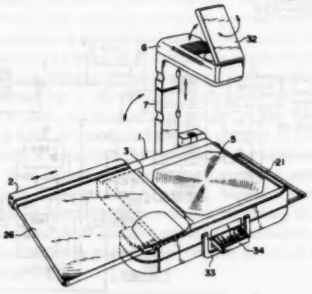
Takanori Hasegawa, Hachioji; Nobuyuki Abe, Toride; Toru Hibara, Tachikawa; Toshihiko Hirose, Yatsushiro; Takashi Kanda, Kofu; Hiroshi Saito; Masaki Oshima, both of Koma, and Eiji Nakazawa, Nirasaki, all of Japan, assignors to Riso Kagaku Corporation, Tokyo and Nippon Seimitsu Kogyo Kabushiki Kaisha, Kofu, both of, Japan

Filed Oct. 25, 1989, Ser. No. 426,550

Claims priority, application Japan, Oct. 31, 1988, 63-275789; Oct. 31, 1988, 63-275790; Oct. 31, 1988, 63-142163[U]; Oct. 31, 1988, 63-142164[U]; Oct. 31, 1988, 63-142165[U]; Oct. 31, 1988, 63-142166[U]; Oct. 31, 1988, 63-142167[U]; Oct. 31, 1988, 63-142168[U]

Int. Cl.[5] H04M *1/40*

U.S. Cl. 358—471 7 Claims



1. An image processing apparatus comprising:

(a) an input unit for inputting an image of an initial original in terms of image signals;

(b) a support table on which the initial original is to be set, said support table being movably mounted along said input unit;

(c) an image processing unit for processing the image signals from said input unit;

(d) an image forming unit for forming on a continuous sheet a subject image according to the image signals processed by said image processing unit to provide an OHP original;

(e) a reflection-type focusing plate on which the OHP original is to be set, said reflection-type focusing plate being movably disposed alongside said input unit;

(f) a projecting unit disposed above said reflection-type focusing plate for projecting the subject image of the OHP original set on said reflection-type focusing plate; and

(g) means for detecting the movement of said support table

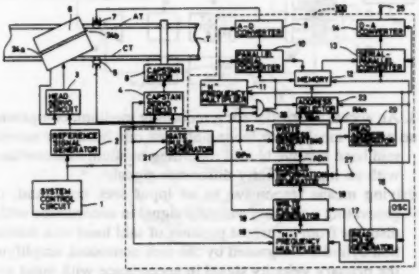
or said reflection-type focusing plate to deenergize said projecting unit.

5,010,421

VARIABLE SPEED SOUND REPRODUCING APPARATUS FOR SOUND REPRODUCTION AND REVIEW SYSTEM

Takeshi Arai, Saitama, Japan, assignor to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Dec. 15, 1988, Ser. No. 284,878
Claims priority, application Japan, Dec. 16, 1987, 57-319321
Int. Cl.[5] G11B *5/09*
U.S. Cl. 360—32 **3 Claims**



1. A sound reproducing apparatus comprising:

means (1, 2, 3, 4, 5, 6, 7, 8) for scanning a recording media having at least a sound signal recorded thereon at a predetermined recording speed, in the direction opposite to that at the time of recording at a reproducing speed N (N: positive integer) times said predetermined recording speed to reproduce said sound signal,

memory means (12) to which and from which a digital signal can be written and read out,

read address generating means (15, 17, 20) for generating a read address signal changed in one direction in a predetermined cycle for specifying an address at which the digital signal is to be read from said memory means,

means (15, 16, 18, 19) for generating address information changed in the direction opposite to that of said read address signal at a speed N times that of said read address signal,

address generating means (21, 22) for supplying said address information as a write address signal for specifying an address at which the digital signal is to be written to said memory means in a cycle corresponding to $N/(N+1)$ times said predetermined cycle of said read address signal and only during a first period corresponding to $1/(N+1)$ times said predetermined cycle of said read address signal,

address supplying means (17, 18, 23, 26) for supplying said read address signal to said memory means when said read address signal is generated and supplying said write address signal to said memory means when said write address signal is generated during the first period,

means (9, 10, 11, 15) for converting the sound signal reproduced by said reproducing means into a digital signal at a first speed proportional to said reproducing speed and writing the same to the address specified by said write address signal in said memory means, and

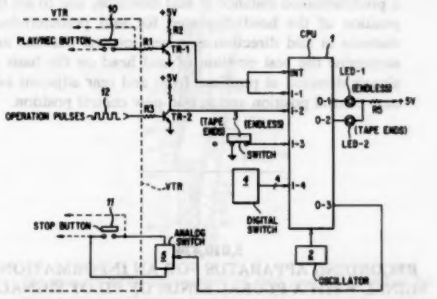
means (13, 14, 15) for reading out said digital sound signal from the address specified by said read address signal in said memory means at a second speed proportional to said recording speed and converting the same into an analog signal.

5,010,422

DRIVING SYSTEM FOR ENDLESS VIDEO TAPE BY ONE-TOUCH TIMER

Kazuo Hashimoto, Tokyo, Japan, assignor to Hashimoto Corporation, Tokyo, Japan

Filed Feb. 21, 1990, Ser. No. 483,034
Claims priority, application Japan, Feb. 24, 1989, 1-44255
Int. Cl.[5] G11B *15/18, 19/02*
U.S. Cl. 360—69 **10 Claims**



1. A driving system for an endless video tape comprising:

a video tape recorder (VTR);

a one-touch timer which is preset by a predetermined one-touch operation; and

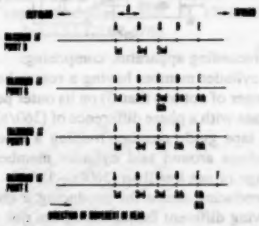
control means for driving the VTR in response to the one-touch timer, including means for automatically stopping the VTR if a set time of a predetermined period of said one-touch timer elapses during a driving operation of the VTR, and means responsive to a change in a VTR operation mode to any other mode during said driving, for automatically extending the set time of said one-touch timer for the predetermined period of time and stopping the VTR after said predetermined period of time elapses.

5,010,423

TRACKING DEVICE AND METHOD

Yuji Sakaegi, Tokyo, and Nobuo Fukushima, Kanagawa, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 51,479, May 18, 1987, abandoned. This application Nov. 27, 1989, Ser. No. 442,383
Claims priority, application Japan, May 21, 1986, 61-116954
Int. Cl.[5] G11B *5/596*
U.S. Cl. 360—77.06 **12 Claims**



1. An automatic tracking device for detecting a level of a signal reproduced from a track on a recording medium by a reproducing head and tracking said head to a position at which the signal takes the maximum level, comprising:

(a) indicating means for indicating a target track;

(b) detecting means operating in such a manner that, prior to the detecting of a signal for the logical central position of said target track, signals for positions front and rear adjacent to said logical central position of said target track,

respectively, are detected, and, after that, the signal for the logical central position of said target track is detected; and

(c) discriminating means for determining the best position of said head based on the signals detected at all the aforesaid positions of said head, said discriminating means being arranged to determine a direction for a location of said best position of said head based on said detected signals in the case where said best position of said head is not determined based on said outputs and to displace said head for a predetermined distance in said direction, and to set the position of the head displaced for said predetermined distance in said direction as a new central position and determine the best position of said head on the basis of signals detected at positions front and rear adjacent said new central position and at said new central position.

5,010,424

RECORDING APPARATUS FOR AN INFORMATION SIGNAL WITH A PLURAL KINDS OF PILOT SIGNALS USING A PLURALITY OF HEADS

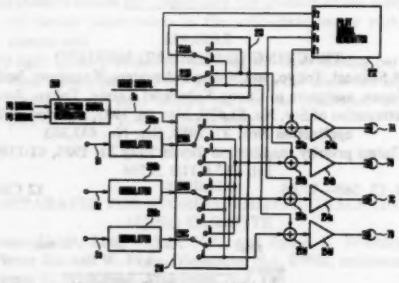
Masahide Hasegawa; Mitsuhiro Otokawa, both of Kanagawa; Hidetoshi Matsuoka, Tokyo, and Noritsugu Hirata, Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 34,793, Apr. 3, 1987, Pat. No. 4,897,739. This application May 10, 1989, Ser. No. 349,755

Claims priority, application Japan, Apr. 7, 1986, 61-078393; Apr. 9, 1986, 61-080146; Apr. 9, 1986, 61-080147; Jun. 23, 1986, 61-144713; Jun. 23, 1986, 61-144714

Int. Cl.[5] G11B *5/588*

U.S. Cl. 360—77.140 **7 Claims**



1. A recording apparatus, comprising:

(a) a cylinder member having n rotary heads (where n is an integer of not less than 3) on its outer peripheral surface to rotate with a phase difference of (360/n)° from each other;

(b) a tape guide member training a tape-shaped recording medium around said cylinder member over an angular range of not less than (360(n−1)/n)°;

(c) producing means for producing n kinds of pilot signals having different frequencies from one another;

(d) input means for inputting an information signal;

(e) recording means for recording said n kinds of pilot signals and said information signal on the medium, said recording means including first supply means for supplying said information signal to said n rotary heads in turn, and second supply means for supplying said n kinds of pilot signals to said n rotary heads, each of said n kinds of pilot signals unchangeably supplying only a predetermined one of said n rotary heads.

5,010,425

ACCESS CONTROLLER FOR CONTROLLING THE SEEK OPERATION OF A HEAD RELATIVE TO A RECORDING MEDIUM

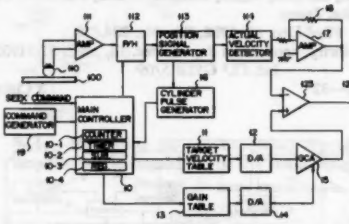
Kenji Asai, Oome, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 5, 1989, Ser. No. 333,279

Claims priority, application Japan, Apr. 6, 1988, 63-84770

Int. Cl.[5] G11B *5/55*

U.S. Cl. 360—78.04 **15 Claims**



1. An access controller for a recording medium, comprising:

an access mechanism having at least one head, for moving said head relative to said recording medium in accordance with an input velocity difference signal;

driving means responsive to an input seek command, for generating a primary velocity signal in accordance with a distance from a current position of said head to a destination cylinder designated by the seek command, amplifying the primary velocity signal in accordance with input gain data to obtain a target velocity signal, generating an actual velocity signal from position data readout from said recording medium by said head while said head is moved, and generating the velocity difference signal from the target velocity signal and the actual velocity signal to output the velocity difference signal to said access mechanism; and

determination means responsive to an input adjustment command, for determining the gain data and outputting the gain data to said driving means.

5,010,426

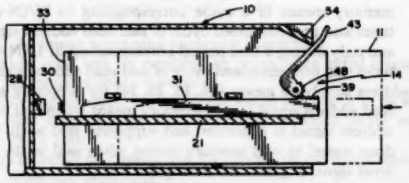
INSTALLATION MECHANISM FOR REMOVABLE COMPUTER DRIVE MODULE

Horst M. Krenz, Bridgman, Mich., assignor to Zenith Data Systems Corporation, Mt. Prospect, Ill.

Filed Feb. 3, 1989, Ser. No. 306,613

Int. Cl.[5] G11B *17/04*

U.S. Cl. 360—97.01 **12 Claims**



1. A computer component with removable drive module, comprising: a computer component housing including an opening with stationary module guide means, a terminal connector in the housing opening, a drive module removably received in the opening and guided therein by the guide means, having a connector fixed thereto releasably engageable with the housing connector, and an installation assembly for engaging the two connectors and holding the module in position in the housing including an automatically engaging handle operated interengaging drive means having a portion thereof on the

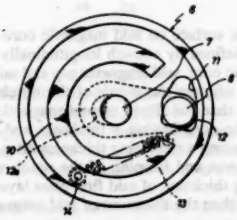
housing interengaging a portion thereof on the module including means to automatically engage and operate the drive by module movement without handle pressure as the module is pushed along the housing guide means toward a position where the connectors engage so the handle may thereafter be operated to move the connectors to their final engaged positions.

5,010,427

APPARATUS FOR POSITIONING A MAGNETIC DISK ON A DISK DRIVE

Katsuhiko Taguchi, and Kazuya Mitsumori, both of Chofu, Japan, assignors to Juki Corporation, Chofu, Japan

Continuation of Ser. No. 767,090, Aug. 19, 1985, Pat. No. 4,873,595. This application Jun. 30, 1989, Ser. No. 374,964
Claims priority, application Japan, Aug. 23, 1984, 59-175784
Int. Cl.[5] G11B *5/012*
U.S. Cl. 360—99.05 11 Claims



1. Apparatus for positioning a magnetic disk upon a magnetic disk drive which includes a motor drive spindle and a turntable fixedly mounted upon said spindle, comprising:

a driving pin;

biasing means for biasingly mounting said driving pin upon said motor drive spindle so as to be movable in both radial and circumferential directions relative to said spindle and said turntable;

means for urging said driving pin toward said spindle;

means for defining a first hole within said magnetic disk within which said motor drive spindle is to be disposed;

means for defining a second hole within said magnetic disk within which said driving pin is to be disposed; and

means for defining a positioning third hole within said turntable for cooperating with said means defining said second hole so as to confine said driving pin between said means for defining said second hole and said means for defining said third hole whereby said magnetic disk will be properly positioned upon said magnetic disk drive.

5,010,428

TILTING OPTICAL DISC LOADING MECHANISM WITH AUTOMATIC CENTERING AND EJECTION OF DISCS OF DIFFERENT DIAMETERS

Stephane M. d'Alayerde Costemore d'Arc, Brussels, Belgium, assignor to Staar S.A., Belgium

Filed Sep. 26, 1989, Ser. No. 412,478
Claims priority, application Belgium, Nov. 17, 1988, 8801303
Int. Cl.[5] G11B *17/04*
U.S. Cl. 360—99.06 24 Claims

1. A disc player/recorder apparatus comprising:

a frame,

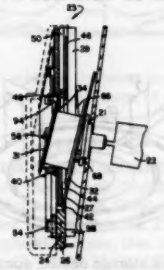
a horizontal spindle on said frame adapted to receive a disc on one end of said spindle in a vertical operating plane, and

a loading and centering device for discs of different diameters including:

a loading member pivotally mounted to said frame for movement between an introduction position and an operating position, said member having a disc loading surface,

guides on said loading surface which engage lateral edges of a disc of a first diameter or of a second smaller diameter and guide either diameter disc along different parallel loading planes to a location substantially centered laterally with respect to the end of the spindle,

positioning elements on said loading surface which engage a lower edge of a disc of the first diameter or of the second diameter and position either diameter disc in a location substantially centered vertically with respect to the end of



the spindle upon movement of said loading member between the introduction position and the operating position whereby the disc is translated between an introduction plane tilted upwardly and away from the vertical operating plane, and is returned to the introduction plane upon return movement of said loading member, and

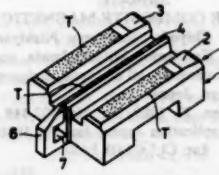
clamping means carried by said loading member for clamping a disc on the end of said spindle in the vertical operating plane when said member is in the operating position.

5,010,429

FLOATING MAGNETIC HEAD HAVING IMPROVED STATIC FRICTION COEFFICIENT

Akira Taguchi; Shigetoshi Morita; Shunichi Taka; Hirohide Yamada; Yoshiaki Takada; Shinji Furuichi, and Masahiro Ao, all of Mooka, Japan, assignors to Hitachi Metals, Ltd., Tokyo, Japan

Filed Jun. 1, 1989, Ser. No. 360,124
Claims priority, application Japan, Nov. 22, 1988, 63-295652
Int. Cl.[5] G11B *5/60*
U.S. Cl. 360—103 8 Claims



1. A magnetic head comprising: a slider made of a polycrystalline ceramic material; and a magnetic core, said slider having a surface to be opposed to a magnetic disk, said opposed surface being formed of lands and grooves having a height difference of 50 to 200 A on an average and a repetition pitch of 5 to 20 microns on an average.

5,010,430

HEAD SLIDER ARRANGEMENT FOR MAGNETIC DISK STORAGE DEVICE

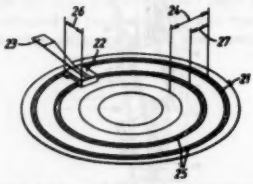
Takehito Yamada, Kanagawa; Kazushi Tanimoto, Tokyo; Yuji Sakai; Takao Murooka, both of Kanagawa; Tetsuo Inoue, Chiba, and Yoshinao Takada, Kanagawa, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 29, 1988, Ser. No. 226,062

Claims priority, application Japan, Jul. 30, 1987, 62-191410; Aug. 13, 1987, 62-202236; Dec. 11, 1987, 62-311884

Int. Cl.[5] G11B 5/60, 5/596

U.S. Cl. 360—103 21 Claims



1. A magnetic disk storage device, comprising:

a magnetic disk having a disk surface including an inner side and an outer side with a storing/reproduction region formed thereon;

a head slider facing the disk surface and having a plurality of parallel projections to generate an air bearing, including an inner floating value and an outer floating value;

a plurality of magnetic heads, each having a head gap in one of said projections; and

means for compensating differences of said floating values of said magnetic heads based on circumferentially different speeds on the inner side and the outer side of the disk surface.

21. A magnetic disk storage device, comprising:

a magnetic disk having a disk surface with a storing/reproduction region including a servo region formed thereof, said storing/reproducing region having a width, said servo region storing coarse servo signal and a fine servo signal;

a head slider facing the disk surface and having a plurality of parallel projections to generate an air bearing;

two magnetic heads each having a head gap in one of said projections and having an interval between head gaps of at least one half of the width of the storing/reproduction region of the disk;

a coarse servo positioning signal detector circuit detecting the coarse servo signal obtained by an inner head;

a fine servo positioning signal detector circuit detecting the fine servo signal obtained by an outer head;

a positioning control circuit controlling the position of the head using outputs of said detector circuits.

5,010,431

FLYING-TYPE COMPOSITE MAGNETIC HEAD

Tadashi Shinohara, Chiyoda; Toshikazu Nishiyama, Fukaya; Kazumi Noguchi, Kamikawa; Hitoshi Iwata, and Shigekazu Suwabe, both of Kumagaya, all of Japan, assignors to Hitachi Metals, Ltd., Tokyo, Japan

Filed Jan. 27, 1989, Ser. No. 302,419

Claims priority, application Japan, Jan. 28, 1988, 63-18382

Int. Cl.[5] G11B 5/60

U.S. Cl. 360—103 23 Claims

1. A flying-type composite magnetic head comprising:

(a) a slider made of a non-magnetic ceramic material and having side rails extending longitudinally on both lateral sides of said head, one of said rails having a slit extending longitudinally therein; and

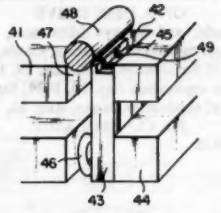
(b) a magnetic core fixable in said slit and including—

(i) a pair of core pieces having flat opposing surfaces parallel to each other for defining a magnetic gap,

(ii) an Fe-Al-Si thin layer formed on one of said flat opposing parallel surfaces of said core pieces,

(iii) a first glass layer for bonding said pair of core pieces together,

(iv) a second glass layer for fixing said magnetic core in said slit, said second glass layer filling the slit on sides of said magnetic core, and



(v) a track surface on said magnetic core having a track width defined by a notch longitudinally formed in said magnetic core, said magnetic gap and said notch having depths wherein the depth of the notch is equal to or greater than the depth of said magnetic gap, and said magnetic core having a thickness and said first glass layer having a remaining thickness after bonding of the core pieces and forming of the notch wherein the remaining thickness of said first glass layer is equal to or greater than the thickness of said magnetic core.

5,010,432

ROTARY HEAD DRUM APPARATUS COMPRISING RESILIENT ELECTRICAL CONNECTORS

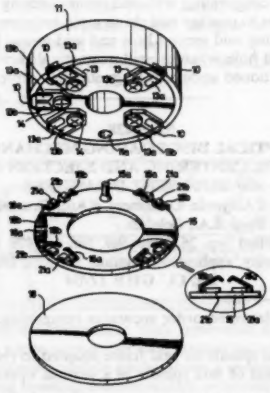
Hideo Fukushima, Tokyo, and Masakazu Kurushima, Kanagawa, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jun. 26, 1989, Ser. No. 371,293

Claims priority, application Japan, Jun. 28, 1988, 63-159942; Jun. 28, 1988, 63-159943; Jun. 28, 1988, 63-159944

Int. Cl.[5] G11B 5/52, 15/60

U.S. Cl. 360—108 10 Claims



1. In a rotary head drum apparatus in which at least one magnetic head is attached to a rotary drum member for rotation relative to a stationary structure, and a rotary transformer is provided for transmitting electrical signals between said magnetic head and said stationary structure and includes a rotor and a stator fixed relative to said rotary drum member

and said stationary structure, respectively, and having respective coils; means for connecting said at least one magnetic head to the coil of said rotor of the rotary transformer comprising:

resilient electrical contactor means;

means for mounting said resilient electrical contactor means on one of said rotary drum member and said rotor; and

electrical contact portion means;

means for mounting said electrical contact portion means on the other of said rotary drum member and said rotor for contact with said electrical contactor means, and wherein said electrical contactor means is urged resiliently against said electrical contact portion means in response to assembling together of said rotary drum member and said rotary transformer; and

means electrically connecting said at least one magnetic head with one of said electrical contactor means and said electrical contact portion means which is mounted on said rotary drum member, whereby an electrical path is established between said at least one magnetic head and said rotor.

5,010,433

MAGNETORESISTIVE MAGNETIC HEAD HAVING A SHUNT FILM OF NB

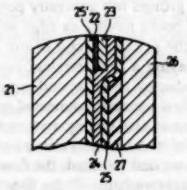
Masahiro Kitada, Hamura; Noboru Shimizu, Tokorozawa; Hideo Tanabe, Higashi-murayama, and Hitoshi Nakamura, Hachiouji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 16, 1989, Ser. No. 310,922

Claims priority, application Japan, Feb. 26, 1988, 63-41987

Int. Cl.[5] G11B *5/127*

U.S. Cl. 360—113 **9 Claims**



1. A magnetoresistive magnetic head comprising:

a two-layer film consisting of a magnetoresistive film and a shunt film, the magnetoresistive film being formed of an Ni-Fe alloy film which contains 7 to 27 wt % of Fe and a virtually remaining percentage of Ni, and the shunt film being formed of an Nb film having an electrical resistivity of not more than 30 μΩcm and being deposited by the electron-beam evaporation method.

5,010,434

TAPE CASSETTE HAVING A TWO-REEL BRAKE SYSTEM HAVING IDENTICAL BRAKE LEVERS THEREFOR

Klaus Schoettle, Heidelberg; Artur Buhk, Erpolzheim, and Lothar Glinlorz, Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

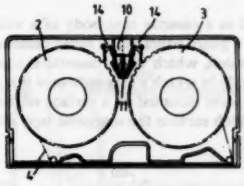
Filed Apr. 14, 1989, Ser. No. 338,093

Claims priority, application Fed. Rep. of Germany, Apr. 23, 1988, 68805416[U]

Int. Cl.[5] G11B *23/02, 15/32*

U.S. Cl. 360—132 **9 Claims**

1. A tape cassette having a two-reel brake system, substantially consisting of an actuating element and two rotatable brake levers which are associated with two reels, mounted with bias on a cassette housing and arranged for actuation by



an actuating element, wherein the brake levers are of identical shape rather than being a mirror image of each other.

5,010,435

HUB FOR A DISK TYPE RECORDING MEDIUM

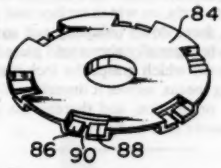
Haruo Shiba; Masaru Ikebe, and Toshihiko Ishida, all of Komoro, Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Dec. 2, 1988, Ser. No. 279,090

Claims priority, application Japan, Dec. 3, 1987, 62-184643

Int. Cl.[5] G11B *23/03, 5/84*

U.S. Cl. 360—133 **1 Claim**



1. A hub to be attached to the central portion of a recording medium which comprises:

a flat plate-like body made of a metallic material and including upper and lower surfaces and at least one indentation having a depth sufficiently large to form an aperture between the lower surface of the flat plate-like body and an upper surface of the indentation, the aperture having an outer boundary positioned substantially transversely to at least one of the upper and lower surfaces of the flat plate-like body, and

an annular resinous body firmly attached to said flat plate-like body by insertion-molding such that at least a portion of the annular resinous body extends through the aperture for connection said annular resinous body to said flat plate-like body,

wherein said at least one indentation is divided into two sections, and

wherein in addition to said aperture a slit is formed in at least one indentation in the radial direction.

5,010,436

APPARATUS FOR INCORPORATING LOCK PLATES IN VIDEO CASSETTES

Naoto Takayama, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 28, 1989, Ser. No. 413,670

Claims priority, application Japan, Sep. 29, 1988, 63-245796; Oct. 4, 1988, 63-130211[U]

Int. Cl.[5] G11B *23/113*

U.S. Cl. 360—137 **4 Claims**

1. An apparatus for incorporating a lock plate in a video cassette, wherein a lock plate composed of:

(a) a sheet-like plate body,

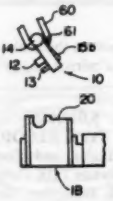
(b) protrusions protruding from the plate body in a direction approximately normal thereto,

(c) a shaft combined integrally with the plate body and

extending adjacent and approximately parallel to the plate body, and

(d) a torsion spring having a coiled portion engaged with the shaft,

is incorporated in a cassette case body of a video cassette in order to allow a guard panel of the video cassette to be locked in a closed position, which video cassette is composed of the cassette case body in which a magnetic tape is accommodated, and the guard panel mounted on a surface of the cassette case body, along which surface the magnetic tape slides,



the apparatus for incorporating a lock plate in a video cassette comprising:

(i) a plate holding means which holds said lock plate in an obliquely inclined orientation so that the surface of said plate body, on which surface said protrusions are formed, faces down obliquely and so that said shaft extends horizontally above said plate body, and

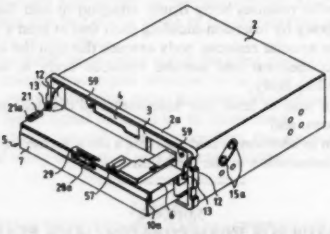
(ii) a fitting means which grasps the lock plate held by said plate holding means, moves it linearly while keeping it in the inclined orientation, and thereby fits said lock plate into said cassette case body.

5,010,437

RECORDING MEDIUM PLAYER APPARATUS

Nobuo Utsugi; Hisashi Kihara; Shuichi Mori; Junichi Fuse; Takashi Miyake, and Yoshikatsu Ikata, all of Saitama, Japan, assignors to Pioneer Electronic Corp., Tokyo, Japan

Filed Mar. 6, 1990, Ser. No. 488,826
Claims priority, application Japan, Jun. 7, 1989, 1-144413
Int. Cl.[5] G11B *33/02*
U.S. Cl. 360—137 **7 Claims**



1. A recording medium player apparatus comprising

a housing enclosing a play means and having an insertion slot formed at a front surface portion thereof for insertion of a recording medium carrying an information signal;

an open/close body disposed so as to openably cover said insertion slot and provided with an operation portion for controlling the operation of said play means; and

further comprising a support member pivotally disposed on said housing for pivotally supporting at a free end portion thereof said open/close body;

a first driving means for pivotally moving said support member; and

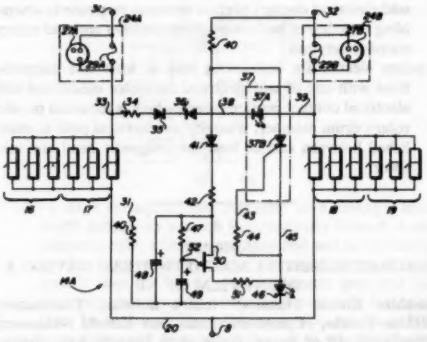
a second driving means for pivotally moving said open/close body relative to said support member.

5,010,438

PLUG-IN TRANSIENT VOLTAGE SUPPRESSOR MODULE

Peter J. Brady, Glendale, Ariz., assignor to Square D Company, Palatine, Ill.

Filed Jun. 16, 1989, Ser. No. 367,028
Int. Cl.[5] H02H *9/06*
U.S. Cl. 361—56 **20 Claims**



1. A surge suppressor module capable of repeatedly suppressing ten kiloampere surges, comprising in combination:

(a) a printed circuit board having a plurality of metal strip conductors thereon, and a plurality of via holes extending through the printed circuit board and through the various metal strip conductors;

(b) an elongated ground bus generally perpendicular to the printed circuit board having an edge soldered to a metal conductor on the printed circuit board;

(c) a first fuse having a first terminal connected to a first power line conductor, and a second terminal, and a second fuse having a first terminal connected to a second power line conductor and also having a second terminal;

(d) a first group of metal oxide varistors each having a first terminal and a second terminal, the first terminal of each of the metal oxide varistors of the first group being connected to the second terminal of the first fuse, the second terminals of the metal oxide varistors of the first group being connected, respectively, by some of the metal strip conductors to the edge of the ground bus by means of the metal conductor, and a second group of metal oxide varistors each having a first terminal and a second terminal, the first terminals of the metal oxide varistors of the second group being connected to the second terminal of the second fuse, the second terminals of the metal oxide varistors of the second group being connected by some of the metal strip conductors to the edge of the ground bus by means of the metal conductor, the metal oxide varistors of the first and second groups being positioned on opposite sides of the ground bus;

(e) a plastic housing adapted to be plugged into a single slot of a power distribution panel enclosing the printed circuit board, the ground bus extending through a first edge wall of the housing;

(f) means for connecting an external ground conductor to the ground bus;

(g) first and second conductive prongs extending through a second edge wall of the housing;

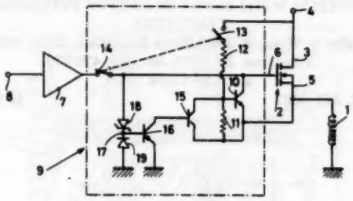
(h) first and second means attached to the printed circuit board and electrically connected to the first and second power line conductors for electrically contacting the first and second conductive prongs, respectively.

5,010,439

CONTROL CIRCUIT FOR THE CLAMPING VOLTAGE OF AN INDUCTIVE LOAD DRIVEN BY A POWER DEVICE IN A HIGH SIDE DRIVER CONFIGURATION

Michele Zisa, Comiso, and Sergio Palara, Acicastello, both of Italy, assignors to SGS-Thomson Microelectronics s.r.l., Milano, Italy

Filed Jun. 12, 1989, Ser. No. 364,174
Claims priority, application Italy, Jul. 29, 1988, 21561 A/88
Int. Cl.[5] H02H 7/20; H03K 17/60
U.S. Cl. 361—91 3 Claims



1. Control circuit for the clamping voltage of an inductive load driven by a power device having a power supply terminal, a load terminal connected to earth through the inductive load and a control terminal connected to an alternating control signal input, there being provided a discharge circuit for the inductive load which is activated when said clamping voltage is attained, characterized in that it includes a switching element connected between said control terminal and said load terminal and having a control element connected to a voltage supply by first switching means operating in push-pull with second switching means connected between said control terminal and said control signal input and at the latter's same frequency so as to accomplish a direct connection between said control terminal and said load terminal whenever the power device is shut down, said discharge circuit including threshold means having a predetermined firing threshold which are activated when the voltage at the load terminal of the power device falls below earth until it reaches said firing threshold where said threshold means are constituted by a Zener diode connected between said control terminal of the power device and earth by a diode, there being provided means sensitive to the firing of said Zener diode to control the deactivation of said switching element for the subsequent turning on of said power device.

5,010,440

PIPE LINER HAVING ELECTRICALLY CONDUCTIVE WIRES FOR HARDENING AND ELECTROSTATIC BUILD-UP PREVENTION

Mamiko Endo, Kita-Kasukabe Haitsu, 368, Umeda, Kasukabe-shi, Saitama-ken, Japan

Filed Dec. 6, 1989, Ser. No. 446,889
Claims priority, application Japan, Dec. 9, 1988, 63-310160
Int. Cl.[5] H05F 1/00; F16L 11/12, 55/18, 55/16
U.S. Cl. 361—215 8 Claims

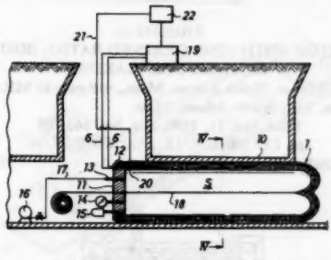
1. A pipe liner (1) with which a pipe is internally lined, comprising:

a resin-absorbable flexible tube made of electrically conductive material,

an electrically insulating means which is provided along at least one generatrix of said resin-absorbable flexible tube and penetrating through the whole thickness thereof, so as to electrically disconnect the circumferential circuit formed by said resin-absorbable flexible tube at said at least one generatrix,

a thermosetting resin absorbed in said resin-absorbable flexible tube,

at least one pair of wires having an electrical conductivity greater than that of said resin-absorbable flexible tube, said at least one pair of wires being laid on, and passed along the whole length of, said resin-absorbable flexible tube, and being arranged such that the wires of the same pair are close to each other but are electrically isolated from each other by said electrically insulating means, and



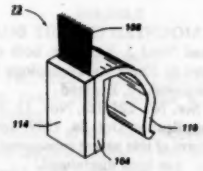
an electrically insulating hermetic film which forms the innermost layer of said pipe liner, when the pipe liner is inserted in the pipe.

5,010,441

GROUNDING BRUSH

Elizabeth D. Fox, Rochester, and Alan G. Schlageter, Ontario, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jan. 24, 1990, Ser. No. 469,873
Int. Cl.[5] H05F 3/02; G03G 21/00
U.S. Cl. 361—221 10 Claims



1. A device for electrically conductive rotating shaft, including:

an electrically grounded member;

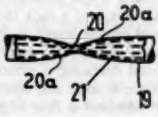
electrically conductive means, mounted removably on the shaft and rotating therewith to periodically contact said grounded member, for periodically electrically grounding the rotating shaft.

5,010,442

BREAK-AWAY ELEMENT FOR ELECTRICAL CAPACITOR

Werner Erhardt, Ballendorf, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed May 26, 1989, Ser. No. 357,251
Claims priority, application Fed. Rep. of Germany, May 26, 1988, 3817903
Int. Cl.[5] H01G 1/13
U.S. Cl. 361—275 11 Claims



1. In an electrical capacitor having a housing, an improved

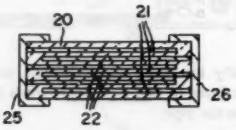
over-pressure break-away element composed of a malleably deformed wire having a rated break location with a smooth surface and a gradual continuous transition from a cross section of said wire to a cross section of said break location.

5,010,443

CAPACITOR WITH FINE GRAINED $BATIO_3$ BODY AND METHOD FOR MAKING

Galeb H. Maher, North Adams, Mass., assignor to MRA Laboratories, Inc., North Adams, Mass.

Filed Jan. 11, 1990, Ser. No. 463,705
Int. Cl.[5] H01G *4/12, 7/00;* C04B *35/46*
U.S. Cl. 361—321 15 Claims



1. A monolithic ceramic capacitor comprised of a barium titanate body, two groups of interdigitated electrodes buried in said body and extending respectively to opposite ends of said body, and two conductive terminations contacting said two groups respectively at said opposing body ends:

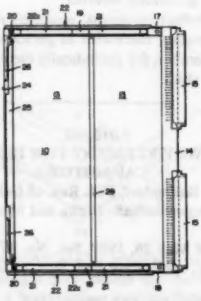
said body being comprised of sintered barium titanate grains having an average size of from 0.5 to 0.9 micron, and in the grain boundaries from 1.5 to 2.5 weight percent of a silicate flux and a lesser amount of a reactivity-inhibitor compound.

5,010,444

RACK MOUNTED CIRCUIT BOARD

Alan J. Storrow, and Nigel J. Knighton, both of Northampton, England, assignors to Radstone Technology Limited, Northampton, Northamptonshire, England

Continuation of Ser. No. 121,023, Nov. 13, 1987, Pat. No. 4,879,634. This application Oct. 24, 1989, Ser. No. 426,548
The portion of the term of this patent subsequent to Nov. 7, 2006, has been disclaimed.
Int. Cl.[5] H05K *7/20*
U.S. Cl. 361—386 14 Claims



14. The combination of a box, a rack mounted circuit board, and a board clamping means removably clamping the circuit board in the box,

said box comprising a bus arrangement provided at a rear portion of said box; and a rack including at least one slot into which said circuit board slides;

said circuit board comprising a substrate having opposed first and second surfaces; a printed ci. uit provided on said first surface; at least one connector mounted on said circuit board adjacent a first edge of said circuit board which connects said printed circuit to said bus arrangement; heat management means provided on said second surface conducting excess heat from components supported on said circuit board including at least one guide at each of a pair of opposite edges of said circuit board adjacent said first edge, said guide defining a conduction surface and projection means formed by each guide for inserting said circuit board in said rack; and

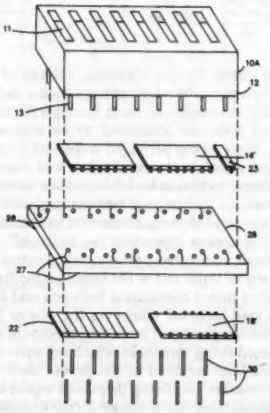
said board clamping means urging each conduction surface of the guides into thermal contact with a surface of said rack and clamping the circuit board.

5,010,445

DIP SWITCH WITH BUILT-IN ACTIVE INTERFACING CIRCUITRY

Christoffer S. Weinold, 1307 Ridge Rd., Vista, Calif. 92083

Filed Jan. 25, 1990, Ser. No. 470,089
Int. Cl.[5] H05K *7/00*
U.S. Cl. 361—392 18 Claims



1. An integrated switch and circuit assembly comprising:

a dual-inline package comprising an elongated body having a top rectangular surface, a bottom rectangular surface opposite to said top rectangular surface, of the same size as said top rectangular surface, and having a first plurality of metal leads having a given spacing and size and extending therefrom such that said leads can be attached to a mounting device and provide electrical and mechanical connections for said package,

said dual-inline package containing a plurality of switches, said switches each having a manually operable switch-actuating member on said top surface and a plurality of switch contacts within said package,

an electrical circuit comprising a plurality of interconnected electronic components, said components including a plurality of transistors arranged to provide an active electronic circuit for interfacing said switches with an electronic system, said electrical circuit being mechanically mounted in said package between said top and bottom rectangular surfaces of said package, and

means for electrically interconnecting said electrical circuit between said switch contacts and said first plurality of metal leads, said means for interconnecting comprising (a) a corresponding second plurality of metal leads having the same spacing between adjacent leads as said first plurality of leads, and (b) means for connecting said electronic components to both of said pluralities of leads,

said electrical circuit and said means for interconnecting being confined within the dimensions of said bottom and top rectangular surfaces of said dual-inline package when

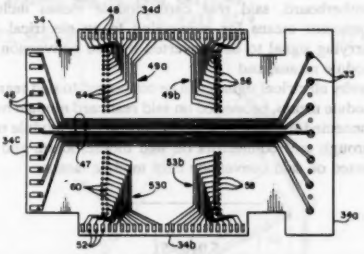
seen from a direction facing and orthogonal to said top rectangular surface.

5,010,446

MULTI-EDGE EXTENDER BOARD

Michael B. Scannell, Chicago, Ill., assignor to Commonwealth Edison Company, Chicago, Ill.

Filed Oct. 30, 1989, Ser. No. 428,917
Int. Cl.[5] G01R *31/22*
U.S. Cl. 361—398 **34 Claims**



1. For use with a circuit board having first and second adjacent edges with first and second terminal means respectively disposed thereon for coupling said circuit board to circuitry in a support structure in which said circuit board is mounted, apparatus for directly coupling said circuit board to said circuitry with said circuit board removed from said support structure, said apparatus comprising:

a generally planar, rigid substrate having a plurality of edges;

third and fourth terminal means disposed on respective opposed first and second edges of said substrate for coupling the circuitry in the support structure to the circuit board, wherein the apparatus further includes conductive means for electrically coupling said third and fourth terminal means and wherein said third terminal means for coupling to the circuitry in the support structure and said fourth terminal means is for coupling to the first terminal means of the circuit board;

fifth and sixth terminal means respectively disposed on a third edge and on an inner portion of said substrate for coupling the circuitry in the support structure to the circuit board, wherein said third edge is adjacent to the first edge of said substrate and said fifth and sixth terminal means are electrically coupled; and

first coupling means for coupling said sixth terminal means to the second terminal means on the circuit board.

5,010,447

DIVIDED CAPACITOR MOUNTING PADS

James S. Wallace, Sugarland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

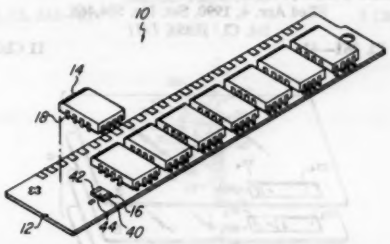
Filed Dec. 28, 1988, Ser. No. 290,778
Int. Cl.[5] H05K *7/10*
U.S. Cl. 361—400 **10 Claims**

1. An arrangement for surface mounting an electrical component in a desired circuit that is carried on an insulating substrate, the arrangement being testable electrically to indicate the proper mechanical mounting of said component, said arrangement comprising:

A. a first pad carried on said substrate and at which said component is to be mounted, said first pad having two parts electrically insulated from one another and spaced from one another by a certain distance;

B. said component having a first terminal with a dimension of at least said certain distance, said component being mounted to said two parts of said first pad to bridge mechanically and electrically the space between said two parts with said terminal; and

C. one lead in said desired circuit extending to one part of said first pad and another lead in said desired circuit ex-



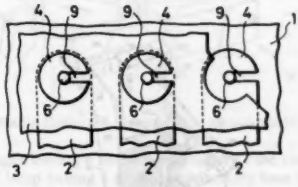
tending to the other part of said first pad to place said component terminal bridging said space between said pad parts in series with said leads so that proper mechanical mounting of said terminal to said two pad parts becomes testable by a series circuit through said leads.

5,010,448

PRINTED CIRCUIT BOARD

Tadaomi Kobari, Iwaki, Japan, assignor to Alpine Electronics Inc., Tokyo, Japan

Continuation-in-part of Ser. No. 134,619, Dec. 18, 1987, abandoned, which is a continuation of Ser. No. 900,500, Aug. 26, 1986, abandoned. This application Jan. 18, 1989, Ser. No. 298,527
Int. Cl.[5] H05K *7/10*
U.S. Cl. 361—403 **11 Claims**



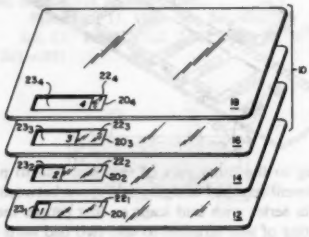
1. A printed circuit board having a plurality of conductive patterns printed on an insulating substrate, said patterns having a plurality of respective lands, each of said lands being formed by a layer of conductor material, each of said lands having a center hole formed through a center portion of said lands, said substrate having holes therethrough in alignment with each of said center holes in said lands for mounting a respective electrical terminal therethrough, and each of said lands having one or more peripheral holes at peripheral portions of said lands, said substrate being imperforate beneath said peripheral holes,

said peripheral holes being solely for the purpose of reducing the area of conductor material on which solder adheres so as to limit the amount of solder adhering to said lands and to prevent the formation of a solder bridge between adjacent lands.

5,010,449
MULTI-LAYER PRINTED CIRCUIT BOARD AND A METHOD FOR ASSURING ASSEMBLY IN A SELECTED ORDER

Robert L. Baldino, Spencerport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 4, 1990, Ser. No. 504,466
Int. Cl.[5] H05K *1/11*
U.S. Cl. 361—414 **11 Claims**



1. A method for assuring that a multi-layer circuit board has been assembled in a selected order comprising the steps of:

forming a label on each layer of the multi-layer circuit board, with each label having a unique indicia thereon indicative of that layers position in a correctly assembled multi-layer circuit board;

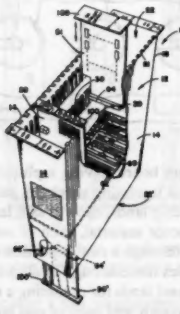
forming a semi-transparent area in each layer above the last layer to be viewed, with the size of each semi-transparent area limited to that necessary to view only the indicia of the correctly assembled layers positioned below that particular layer, such that an incorrectly positioned layer prevents the viewing of at least one indicia; and

viewing the assembled multi-layer circuit board to assure the order of said unique indicia.

5,010,450
FRONT-REAR MODULAR UNIT

David A. Werdin, Eagan, and Reinhold Henke, St. Paul, both of Minn., assignors to ADC Telecommunications, Inc., Minneapolis, Minn.

Continuation of Ser. No. 204,751, Jun. 10, 1988. This application Sep. 21, 1988, Ser. No. 247,151
Int. Cl.[5] H05K *7/14*
U.S. Cl. 361—415 **29 Claims**



1. A front and rear modular conversion unit comprising:

a chassis including four side-walls and open front and rear ends;

a motherboard printed circuit board mounted inside said chassis to form a front module insertion area and a rear module insertion area, said motherboard including a plurality of connectors for receiving a cooperating mating connector, said connectors mounted on both sides of said motherboard;

means for connecting connectors on opposite sides of said motherboard in pairs;

one or more conversion card module means for converting a conditioned electrical signal to a fiber optic signal mounted in the front end of said chassis and mating with said connectors;

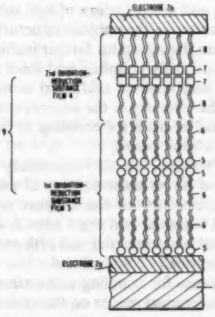
one or more rear card module means each for conditioning electrical signals to provide said conditioned electrical signals, said rear card module means mounted in the rear of said chassis and mating with said connectors on said motherboard, said rear card module means including connector means for connecting to an electrical cable carrying signal to be converted by said conversion card module means; and

whereby electrical signals can be connected to said rear card module means, processed on said rear card module means, connected through to said conversion card module means through said connectors on said motherboard, and converted on said conversion card module means.

5,010,451
ELECTRONIC DEVICE

Satoshi Ueyama; Hiroaki Kawakubo; Satoru Isoda, and Mitsuo Maeda, all of Hyogo, Japan, assignors to Mitsubishi Denki K.K., Tokyo, Japan

Filed Mar. 28, 1990, Ser. No. 500,347
Claims priority, application Japan, Mar. 29, 1989, 1-79236; Mar. 29, 1989, 1-79237; Mar. 31, 1989, 1-81827
Int. Cl.[5] H01G *9/02*; B32B *7/02*; A01N *43/38*
U.S. Cl. 361—504 **12 Claims**



1. An electronic device comprising:

a first oxidation-reduction substance film of a first oxidation-reduction substance;

a second oxidation-reduction substance film of a second oxidation-reduction substance having a redox potential different from that of said first oxidation-reduction substance and being accumulatedly contacted and joined on said first oxidation-reduction substance film; and

a first electrode electrically connected to said first oxidation-reduction substance film and a second electrode electrically connected to said second oxidation-reduction substance film;

wherein said first oxidation-reduction substance is composed of one of a flavin derivative and a porphyrin derivative while said second oxidation-reduction substance is composed of another one so as to provide transistor characteristics or switching characteristics by utilizing the difference in redox potential between said first and second oxidation-reduction substances.

5,010,452

THERAPEUTIC LAMP FOR BIOSTIMULATION WITH POLARIZED LIGHT

Werner Krebser, Embrach, Switzerland; Michael Lantos, Budapest, and Peter Kolta, Pécs, both of Hungary, assignors to Harrier GmbH Gesellschaft fur den Vertrieb medizinischer und technischer Gerate, Fed. Rep. of Germany

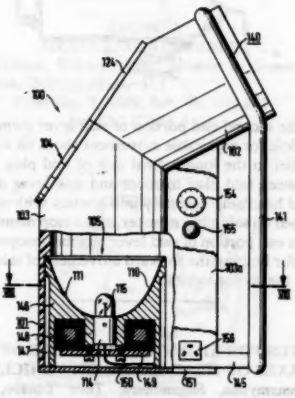
PCT No. PCT/EP88/00900, § 371 Date Apr. 14, 1989, § 102(e) Date Apr. 14, 1989, PCT Pub. No. WO89/03236, PCT Pub. Date Apr. 20, 1989

PCT Filed Oct. 7, 1988, Ser. No. 348,008

Claims priority, application Fed. Rep. of Germany, Oct. 7, 1987, 3733905; Sep. 16, 1988, 88115249

Int. Cl.[5] F21V *9/14*

U.S. Cl. 362—19 11 Claims



1. Therapeutic lamp for biostimulation with polarized light, comprising a light source with a power substantially between 30W and 300W and being substantially a point source, a reflector with a rotational paraboloid light reflecting surface defining a focal point arranged behind the light source so that said focal point substantially coinciding with said point source to reflect forward the majority of light emitted by said source in a parallel path, a polarizer arranged in said path to generate polarized output light propagating in a predetermined direction and having a cross-section of at least 100 cm^2, wherein said lamp further comprises a first tube with a first axis coinciding with axis of rotation of said paraboloid surface, said reflector with said light source being fixed to said first tube so that a sealed connection is provided therebetween, a second tube with a second axis closing an angle between 100° and 20° with said first axis, said tubes having substantially equal and circular cross-sections and are attached to each other to form an integral housing, both of said tubes are cut with a plane extending normal to a plane determined by said first and second axes so that said plane cuts substantially the whole cross-sections of both tubes, said cutting plane closing substantially the same angle with said first and second axis, whereby an opening with an elliptical contour line is defined, a light diverting means closing said opening for diverting light arriving from said first tube to axial direction of said second tube, said means comprising a closing plate of a heat conducting material, a light transparent plate arranged in frontal section of said second tube to close inner space thereof, and heat dissipating means for providing operational temperature for said light source, said tubes forming parts of an integral housing made preferably of a plastic material, said housing comprises a round bar encircling the frontal and upper half of said second tube and extending downwardly substantially parallel to said first axis in the form of a pair of spaced legs.

5,010,453

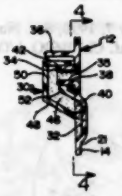
VEHICLE LAMP VENTILATION SYSTEM

Sylvan R. Ketterman, Pendleton, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 28, 1990, Ser. No. 573,620

Int. Cl.[5] F21M *3/00*

U.S. Cl. 362—61 3 Claims



1. In combination with a vehicle lamp housing provided with a backwall defined by an inner reflecting surface and a outer support surface, a tubular projection extending outwardly from said support surface of said lamp housing and having an opening formed therein for allowing air to flow into and out of said lamp housing, a channel formed in said outer support surface of said housing adjacent said tubular projection, a vent device made of an elastomeric material connected to said tubular projection and cooperating with said channel to provide a shielded passage for said air to flow to and from said opening through said channel for venting the interior of said lamp housing.

5,010,454

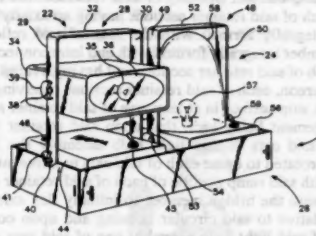
PORTABLE LIGHT ASSEMBLY FOR AN AUTOMOBILE

Steven R. Hopper, 1596 "A" Coronado Ave., San Diego, Calif. 92154

Filed Jul. 12, 1989, Ser. No. 378,652

Int. Cl.[5] B60Q *1/00*

U.S. Cl. 362—61 4 Claims



1. A portable flashlight assembly for an automobile comprising:

a flashlight having a rechargable battery base unit;

a signal lamp having a rechargable battery base unit;

a combination recharging and storage housing;

means for detachably securing said respective rechargable battery base units to said combination recharging and storage housing so that they may be recharged from the battery of an automobile; and

said flashlight comprising:

an inverted U-shaped handle having a pair of laterally spaced upright members each having a top end and a bottom end, said respective top ends being connected by a cross member, the bottom ends of said upright members being pivotally secured to the rechargable battery base unit of said flashlight;

a lamp housing having laterally spaced side walls and a front wall having a lens mounted therein, a high intensity bulb removably mounted in said lamp housing behind said lens; and

means for pivotally supporting said lamp housing about a horizontal axis between said spaced upright members at a height intermediate said top and bottom ends.

5,010,455

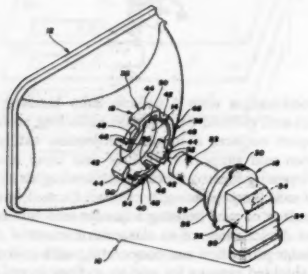
HEADLAMP ASSEMBLY

John M. Luallin; William E. Nagengast, and Robert G. Roeske, all of Anderson, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed May 7, 1990, Ser. No. 520,314

Int. Cl.[5] B60Q 1/00

U.S. Cl. 362—61 3 Claims



1. In combination, a vehicle headlamp assembly including a plastic reflector formed with a parabolic reflecting surface and a circular opening in said reflecting surface and adapted to receive the light bulb of a replaceable light bulb assembly from the rear of said reflector, said replaceable light bulb assembly having a collar and three circumferentially spaced ears projecting radially outwardly therefrom, a retainer integrally formed on the rear of said reflector during the molding of said reflector for receiving said ears and for maintaining said light bulb assembly in a predetermined position relative to said circular opening, said retainer comprising three separate and physically separated circumferentially retainer sections surrounding said circular opening of said reflector, the opposite ends of each of said retainer sections having an axially extending leg integrally formed with the rear of said reflector, a bridge member integrally formed with and interconnecting the legs of each of said retainer sections and having a ramp portion formed thereon, each of said retainer sections receiving one of said ears, a stop surface in at least one of said retainer sections, the arrangement being such that upon said retainer sections receiving said ears of said light bulb assembly the latter is thereafter rotated to cause each of said ears to move into initial contact with said ramp portion of each of said retainer sections so as to cause the bridge member to initially flex axially outwardly relative to said circular opening and upon continued rotation of said light bulb assembly one of said ears engages said stop surface after which said bridge member of each of said retainer sections serves to press said light bulb assembly inwardly towards said circular opening to orient said light bulb axially with respect to said reflecting surface.

5,010,456

HEADLIGHT SUPPORT

Karl-Heinz Reichman, Stockstadt, and Heinrich W. Krumb, Trebur, both of Fed. Rep. of Germany, assignors to General Motors Corporation, Detroit, Mich.

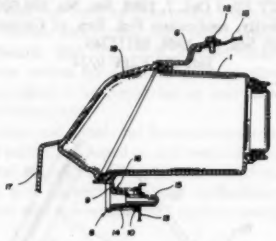
Filed Jan. 19, 1990, Ser. No. 467,435

Claims priority, application Fed. Rep. of Germany, Jan. 26, 1989, 3902229

Int. Cl.[5] B60Q 1/00

U.S. Cl. 362—61 3 Claims

1. A headlamp assembly mounted at the front end of a motor vehicle adjacent a forwardly located panel of the motor vehicle, means connected to an upper portion of said headlamp assembly for allowing said headlamp assembly to pivot about a horizontal axis extending transversely to the longitudinal axis of said motor vehicle, and means connected to a lower portion of said headlamp assembly for biasing the latter forwardly into contact with said panel so as to eliminate any gap between said panel and said headlamp assembly, the improvement wherein said last mentioned means includes a lever member having a first end portion and a second end portion, a plug member formed with said lower portion of said headlamp assembly that extends into the first end portion of said lever member, means



fastening the second end portion of said lever member to said motor vehicle for adjustable movement about an axis substantially parallel to the longitudinal axis of said plug member, a spring between said plug member and said lever member for biasing said headlamp assembly into contact with said panel, a catch formed on said plug member, and a stop member formed on said first end portion of said lever member cooperating with said catch for limiting the forward movement of said headlamp relative to the motor vehicle.

5,010,457

APPARATUS FOR ADJUSTING ATTITUDE OF OPTICAL AXES OF HEAD LAMPS ON VEHICLE

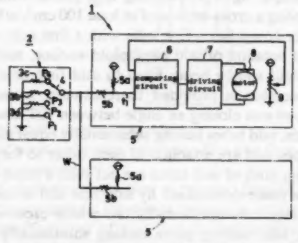
Yukio Ohmamyuda, Sagamihara; Toru Tanabe, Machida; Osamu Matsumoto, Fuchu; Hidenobu Suzuki, Kawasaki, and Masashi Jyouzuka, Yokohama, all of Japan, assignors to Stanley Electric Co., Ltd., Japan

Filed Jul. 31, 1990, Ser. No. 560,106

Claims priority, application Japan, Jul. 31, 1989, 1-89948[U]; Jul. 31, 1989, 1-89949[U]

Int. Cl.[5] B60Q 1/06

U.S. Cl. 362—66 8 Claims



1. In an apparatus for properly adjusting a head lamp on a vehicle wherein said apparatus comprises a motor driven actuator for adjusting an angle of elevation to be assumed by said head lamp and a controlling section for controlling actuation of said motor driven actuator by selectively changing a resistance value thereof, said motor driven actuator including a voltage comparing circuit, a motor circuit responsive to said comparing circuit and a potentiometer for generating a signal representative of the output position of the motor, said comparing circuit generating a signal responsive to the outputs of said potentiometer and said controlling section, said motor circuit comprising a driving circuit and a motor, and said controlling section including a switch and a plurality of resis-

tors selectively connected to said switch via a plurality of contact positions to selectively come in contact with said switch depending on the present angle of a elevation, the improvement comprising:

a voltage dividing circuit arranged upstream of said voltage comparing circuit in the motor driven actutor, said voltage dividing circuit comprising two series connected resistors of which the common junction point between said two resistors is connected to one input terminal of said comparing circuit, one of said two resistors being connected to said switch in the controlling section; and

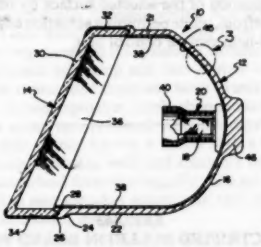
one of said contact positions being directly earthed, whereby said resistance value of the controlling section becomes zero ohms when the angle of elevation assumed by the head lamps is maximized in an upward tilted state being controlled by said voltage dividing circuit.

5,010,458

HEADLAMP ASSEMBLY

Robert L. Fraizer, Kokomo, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Sep. 1, 1989, Ser. No. 401,891
Int. Cl.[5] F21M *3/02*
U.S. Cl. 362—80 **9 Claims**



1. A method of causing the clear lens of a vehicle headlamp to appear to an observer to be of a particular color when not lighted by the headlamp light source to provide a desired amount of light, said method comprising the steps of providing a rectangular headlamp housing having a cavity defined by a pair of planar and parallel upper and lower walls each having an inner surface and joined to a parabolic reflector portion having an inner surface, coating the inner surface of said parabolic reflector portion with a base coat having a desired color, and applying a semi-transparent metallic film over said basecoat so as to allow the color of said basecoat to be seen without preventing the desired amount of light emitted by said light source from being reflected by said parabolic reflector portion through said lens.

5,010,459

CONSOLE/LAMP UNIT COORDINATION AND COMMUNICATION IN LIGHTING SYSTEMS

Brooks W. Taylor, and Thomas E. Walsh, both of Dallas, Tex., assignors to Vari-Lite, Inc., Dallas, Tex.

Continuation of Ser. No. 249,225, Sep. 22, 1988, which is a continuation-in-part of Ser. No. 120,743, Nov. 12, 1987, abandoned, which is a continuation-in-part of Ser. No. 887,178, Jul. 17, 1986, abandoned. This application Jul. 18, 1990, Ser. No. 555,121
Int. Cl.[5] F21V *33/00*
U.S. Cl. 362—85 **36 Claims**

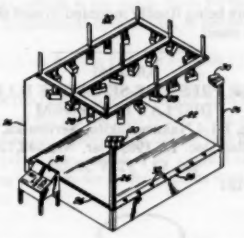
1. A lighting system having a plurality of multiple parameter lamp units each with respective control means for adjusting parameters of the associated lamp, a remote console control system for exercising control over said lamp units, a communication link between said console control system and said units, and a communication control system for coordinating the exchange of information between said console system and said lamps comprising:

(1) in said lamp units,

i. a processor including a communication controller coupled to said link for receiving signals from, and transmitting signals to said console control system:

ii. lamp identification means associated with the respective lamp processor for identifying each lamp to the console control system;

iii. said processor including means for recognizing calls



from said console control system which require a reply by the respective lamp unit;

iv. said processor also including means for generating said replies;

(2) in said console control system:

i. a processor including

(1) a communication controller coupled to said link for receiving signals from, and transmitting signals to said lamp units; and

(2) means for selectively and coordinately exercising communication control over said lamp units.

5,010,460

WATERSCAPE LAMP WITH SHADE OF PROXIMITY-CAPACITANCE-SENSING TYPE DEVICE

John Y. Lin, 1st Floor No. 12, Lane 179, Lee Shing Rd., Sec. 1, San Chung City, Taipei, Taiwan

Filed May 2, 1990, Ser. No. 517,811
Int. Cl.[5] F21V *23/04*
U.S. Cl. 362—101 **3 Claims**

1. A proximity-capacitance-sensing type lamp device with waterscape comprising:

a base block with a bottom plate underneath, having an IC mounted on the bottom side thereof, a center hole for mounting a metal pipe, a bulb socket to mount a small

bulb, a light aperture at one side thereof, and a pair of power wires mounted through one side thereof;

a lamp stand being fixedly mounted on said base block by means of said metal pipe, a metal pad, and a water-tight rubber nut;

a suitable volume of conductive water, being used as a conductor to transmit a signal for controlling the brightness of the lamp device, filled in said lamp stand which is substantially a transparent container;

a lamp shade being mounted on a metal supporting frame; and

a metal fixture being fixedly mounted to said metal pipe over said lamp stand.

5,010,461

MULTICOLOR PRESSURE-SENSITIVE ILLUMINATING DISPLAY PLATFORM

Kunio Saotome, 1-1-4 Nakamurakita, Nerima-ku, Tokyo, Japan

Filed Dec. 11, 1989, Ser. No. 448,724
Int. Cl.[5] F21V *33/00*
U.S. Cl. 362—101 **12 Claims**

1. A display platform for illuminating and supporting an object, comprised of:

(a) a housing having a light passing panel for supporting an object;

(b) illuminating means located in said housing beneath said light passing panel for illuminating an object supported by said light passing panel;

(c) an electrical power supply located in said housing;

(d) pressure sensitive switch means connected in circuit with said illuminating means and said electrical power supply for activating said illuminating means when an object of sufficient weight is placed on said light passing panel;

(e) filter assembly disposed between said illuminating means and said light passing panel, said filter assembly having a plurality of individual filters; and,

(f) means for manually moving the filter assembly, including when the object is disposed on the light passing panel, to selectively align the filters of the filter assembly with the illuminating means for filtering the light from the illuminating means to illuminate the object supported by the light passing panel.

5,010,462

ILLUMINATION DEVICE FOR A HAND-HELD REMOTE CONTROL UNIT

Joseph H. Mintzer, Hartsdale, N.Y., assignor to M.C.R. Farmer, Inc., Hartsdale, N.Y.

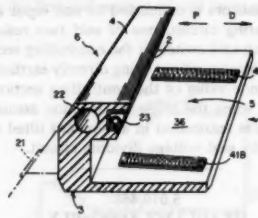
Continuation-in-part of Ser. No. 179,744, Apr. 11, 1988, Pat. No. 4,893,222. This application Jan. 8, 1990, Ser. No. 462,064
The portion of the term of this patent subsequent to Jan. 9, 2007, has been disclaimed.
Int. Cl.[5] F21V *33/00*
U.S. Cl. 362—109 **20 Claims**

1. An illumination device for use with a hand-held remote control unit having a length, width and height and a back panel and a front control panel, said illumination device comprising:

a base and a projection extending from and projecting above said base and being exposed to a space formed above said base;

said projection containing illumination means capable of producing light rays directed toward said space; and

attachment means for releasably attaching at least a portion of the back panel of a hand-held remote control unit to at least



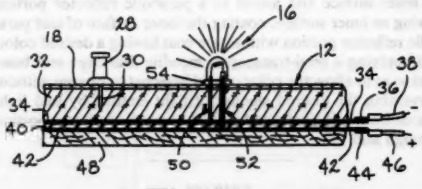
a portion of said base so that at least a portion of the length and width and the entire height of the hand-held remote control unit is maintained in a position within said space above said base so as to subject a selected surface of the front control panel to said illumination means for facilitating illumination of the selected surface by reflecting light rays therefrom, while permitting actuation and operation of the hand-held remote control unit.

5,010,463

ELECTRIFIED BULLETIN BOARD WITH ILLUMINABLE PUSH-PIN

David L. Ross, 2 Ridgemore Dr., Ann Arbor, Mich. 48103

Filed Apr. 30, 1990, Ser. No. 516,477
Int. Cl.[5] F21V *33/00*
U.S. Cl. 362—253 **18 Claims**



1. An electrified display assembly adapted for connection to an electrical power source and comprising:

a penetrable display board having a plurality of substrate layers including a first conductive layer spaced apart from a second conductive layer;

a retaining layer being positioned to one side of said conductive layers and being of a sufficient thickness to thereby prevent a substantial majority of pin-type tacking means from contacting said conductive layers when inserted into said assembly through said retaining layer;

means for conducting said conductive layers to an electrical potential; and

means for illumination capable of being randomly mounted onto said board so as to thereby electrically contact said conductive layers and induce said illumination means to emit light, said retaining layer supporting and retaining said illumination means in said assembly.

5,010,464
ARC LENGTH CHANGING APPARATUS IS EXPOSING DEVICE AND METHOD THEREOF

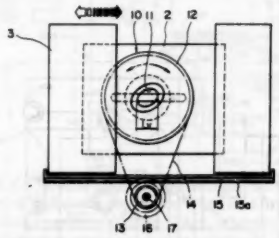
Lee Kwang-sik, Suwon, and Kim Chul-woo, Seoul, both of Rep. of Korea, assignors to Samsung Electron Devices Co., Ltd., Hwasung, Rep. of Korea

Filed Dec. 20, 1989, Ser. No. 453,956

Claims priority, application Rep. of Korea, Dec. 23, 1988, 88-21358[U]

Int. Cl.[5] F21V *13/00*

U.S. Cl. 362—284 **6 Claims**



1. In an exposing device having a lamp, a light-sensitive panel, and a reciprocally movable shutter interposed between said lamp and said panel for guiding light from said lamp to said panel, the improvement comprising a circular control disc interposed between said lamp and said shutter for varying a pattern of light transmitted from said lamp to said shutter, said control disk having sprocket teeth therearound and being rotatable at a speed synchronized with the moving speed of said shutter, said shutter having a frame with a rack formed thereon, a pinion meahsing with and rotatably driven by said rack, a sprocket wheel formed integrally with said pinion, and a chain coupling said sprocket wheel with said sprocket teeth of said circular control disc.

5,010,465
OPTICAL LIGHTING SYSTEM

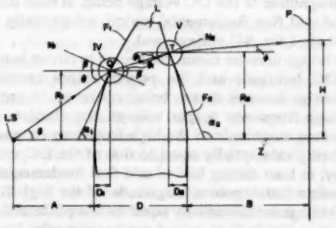
Kenji Endo, and Shinichi Nagata, both of Kyoto, Japan, assignors to Dainippon Screen Mfg. Co., Ltd., Japan

Filed Jul. 27, 1988, Ser. No. 225,039

Claims priority, application Japan, Jul. 31, 1987, 62-193330; Jun. 20, 1988, 63-153305

Int. Cl.[5] F21V *5/00*

U.S. Cl. 362—337 **2 Claims**



1. An optical lighting system for radiating light emitted from a light source to a surface, comprising:

an optical lens associated with a longitudinal optical axis for radiating the light from the light source, the optical lens having an incident light plane and an existing light plane;

the incident light plane and exiting light plane being oriented with respect to the longitudinal optical axis; the orientation of the incident light plane and exiting light plane being effective to produce irradiance on the surface at a point H defined by S(H), and being so that a light ray proceeding from the light source to the incident light plane makes an angle θ with the longitudinal optical axis such that the relationship between S(H) and θ is defined by:

$$\int S(H)HdH = \int J(\theta) \sin \theta d\theta$$

and an angle α_1 made by the incident light plane and the optical axis, is defined by:

$$\tan \alpha_1 = (-n \cos \theta_1 = \cos \theta)/(n \sin \theta_1 - \sin \theta)$$

and an angle α_2, which is the angle made by the exiting light plane and the longitudinal optical axis, is defined by:

$$\tan \alpha_2 = (-n \cos \theta_1 + \cos \theta)/(n \sin \theta_1, -\sin \phi)$$

wherein, $J(\theta)$ is the radiant intensity of the light source, n is the refractive index of the optical lens system, θ_1 is an angle which a light ray proceeding through the optical lens makes with the longitudinal optical axis, and ϕ is an angle a ray proceeding from the exiting plane to the surface makes with the longitudinal optical axis.

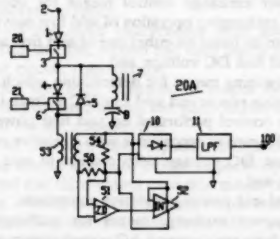
5,010,466
RESONANT MODE POWER SUPPLY WITH CONSTANT OUTPUT VOLTAGE

Fred Mirow, 2725 W. Country Club Rd., Philadelphia, Pa. 19131

Filed Dec. 8, 1989, Ser. No. 448,161

Int. Cl.[5] H02M *3/355*

U.S. Cl. 363—16 **9 Claims**



1. A resonant mode converter for obtaining a DC output voltage comprising;

a transformer;

switch means electrically coupled to said transformer for controlling the frequency at which a capacitor is charged and discharged,

said switch means adapted to switch only during zero current through said switch means,

means for rectifying a transformer signal across said transformer to obtain a pulsating DC voltage,

means for integrating said transformer signal to determine a rectifier input integral value,

means for shorting an input of said rectifying means in accordance with said rectifier input integral value; and,

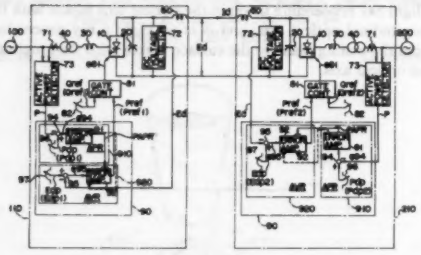
means for filtering the pulsating DC voltage to provide a substantially ripple-free DC output signal.

5,010,467

CONTROL APPARATUS OF DC POWER COUPLING SYSTEM

Yukio Tokiwa, Tokyo; Fumitoshi Ichikawa, Urawa; Naomi Nakamura, Tokorozawa; Syunichi Hirose, Tokyo, and Haruhisa Inokuchi, Kunitachi, all of Japan, assignors to The Tokyo Electric Power Co., Inc., Tokyo and Kabushiki Kaisha Toshiba, Kawasaki, both of, Japan

Filed Nov. 1, 1989, Ser. No. 430,577
Claims priority, application Japan, Nov. 2, 1988, 63-277934
Int. Cl.[5] H02M 5/45; H02J 3/06
U.S. Cl. 363—37 15 Claims



1. A control apparatus of a DC power coupling system being formed of a plurality of power converters which are coupled together by a DC circuit, wherein:

one of said power converters comprises:

first power exchange means for exchanging electric power between a first AC power system and said DC circuit;

first power detecting means for detecting a first active power of the electric power exchanged between said first AC power system and said DC circuit;

first voltage detecting means for detecting a first DC voltage of said DC circuit;

first power exchange control means for controlling the power exchanging operation of said first power exchange means to be based on either one of said first active power and said first DC voltage; and

first determining means for determining which one of said first active power and said first DC voltage is to be used for the control performed by said first power exchange control means in accordance with a relative magnitude of said first DC voltage with respect to said first active power; and

another of said power converters comprises:

second power exchange means for exchanging electric power between a second AC power system and said DC circuit:

second power detecting means for detecting a second active power of the electric power exchanged between said second AC power system and said DC circuit;

second voltage detecting means for detecting a second DC voltage of said DC circuit;

second power exchange control means for controlling the power exchanging operation of said second power exchange means to be based on either one of said second active power and said second DC voltage; and

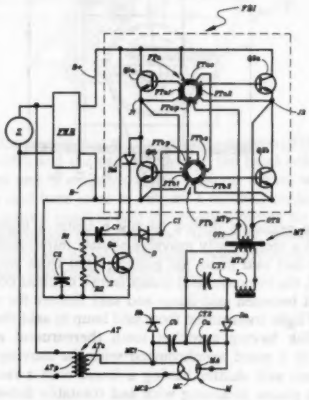
second determining means for determining which one of said second active power and said second DC voltage is to be used for the control performed by said second power exchange control means in accordance with a relative magnitude of said second DC voltage with respect to said second active power.

5,010,468

POWER-LINE-OPERATED HIGH FREQUENCY POWER SUPPLY

Ole K. Nilssen, Caesar Dr., Barrington, Ill. 60010

Continuation of Ser. No. 40,809, Apr. 21, 1987, Pat. No. 4,908,754, which is a continuation of Ser. No. 679,929, Dec. 10, 1984, Pat. No. 4,680,506. This application Jan. 11, 1990, Ser. No. 463,455
The portion of the term of this patent subsequent to Jun. 9, 2004, has been disclaimed.
Int. Cl.[5] H02M 5/458
U.S. Cl. 363—37 12 Claims



1. An arrangement comprising:

a power line providing an AC voltage at a pair of power line terminals; the AC voltage having a first fundamental period and a first fundamental frequency; and

a frequency-converting power supply connected with the power line terminals and operative to provide a high frequency output voltage at a pair of power output terminals; the high frequency output voltage having a second fundamental frequency; the second fundamental frequency being substantially higher than the first fundamental frequency; the frequency-converting power supply including:

(i) a rectifier connected with the power line terminals and operative to provide a substantially unfiltered DC voltage at a set of DC terminals; the absolute instantaneous magnitude of the DC voltage being, at least during half of said first fundamental period, substantially equal to that of the AC voltage; and

(ii) bridge inverter means connected in circuit between the DC terminals and the power output terminals; the bridge inverter means being operative to provide the high frequency output voltage; the absolute instantaneous magnitude of the high frequency output voltage being substantially equal to that of the DC voltage;

whereby, at least during half of said first fundamental period, the absolute instantaneous magnitude of the high frequency output voltage is substantially equal to that of the AC voltage.

5,010,469

UNINTERRUPTIBLE POWER SUPPLY WITH DUAL LEVEL VOLTAGE INPUT

Howard H. Bobry, Lynnwood, Wash., assignor to Albar, Lynnwood, Wash.

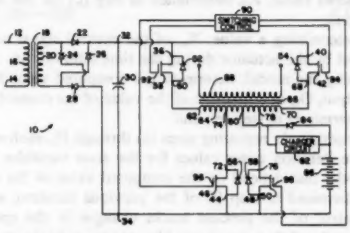
Filed May 9, 1990, Ser. No. 521,236
Int. Cl.[5] H02M 3/335
U.S. Cl. 363—37 7 Claims

1. An inverter comprising:

a transformer having a primary winding and a secondary

winding, said primary winding being divided into at least three portions;

a first d.c. source applied alternately across a first less than all portions of the primary winding and then across a second less than all portions of the primary winding, said first and second less than all portions having a common portion; and



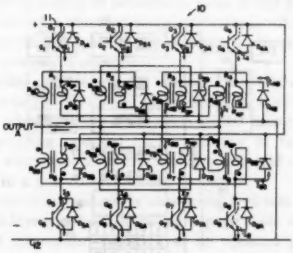
a second d.c. source applied alternatingly across at least a portion of said common portion when said first d.c. source is less than a predetermined voltage, whereby said secondary winding is maintained at a relatively constant a.c. voltage.

5,010,470

CURRENT BALANCING STRUCTURE FOR SEMICONDUCTOR SWITCHING DEVICES

Kenneth Lipman, and Douglas G. Young, both of West Hartford, Conn., assignors to International Fuel Cells, Windsor, Conn.

Filed Mar. 20, 1990, Ser. No. 496,278
Int. Cl.[5] H02M *7/5387*
U.S. Cl. 363—132 **7 Claims**



1. An electrical current balancing structure comprising:

a first reference voltage bus for carrying a first voltage potential;

a second reference voltage bus for carrying a second voltage potential, one of said first and second reference voltage busses defining an output voltage bus, said second reference voltage bus carrying a voltage having a negative polarity relative to a voltage carried by said first reference voltage bus;

a plurality of semiconductor switching devices electrically connected in parallel to one another between said first and second reference voltage busses, each of said semiconductor switching devices having a conductive state and a non-conductive state wherein each of said individual semiconductor switching devices selectively conducts an electric current from said first reference voltage bus to said second reference voltage bus when said respective switching devices are in said conductive state;

magnetic current balancing means connected one-for-one in series between each of said individual semiconductor switching means and said one of said first and second reference voltage busses defining said output bus for causing equal current to flow through said respective individual semiconductor switching devices that are in said conductive state;

a third reference voltage bus for carrying a third voltage potential, and

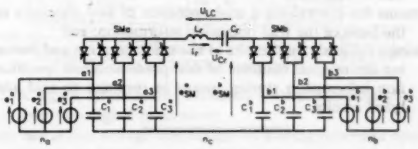
a plurality of diode means for connecting said third reference voltage bus at a junction formed by the series connection between each of said semiconductor switching devices and said balancing means and in a polarity such that an electric current flows between said balancing means and said third reference voltage bus in response to one or more of said individual semiconductor switching devices being in said non-conductive state at substantially the same time that one or more of said individual semiconductor switching devices being in said conductive state, whereby the sum of currents flowing through all of said conductive semiconductor switching devices is less than the current flowing in said one of said first and second reference voltage busses defining said output voltage bus.

5,010,471

THREE-PHASE AC-TO-AC SERIES RESONANT POWER CONVERTER WITH RESTUSED NUMBER OF SWITCHES

J. Ben Klaassens, Delft, Netherlands; Hian K. Lauw, Corvallis, Oreg., and Freddy de Beer, Delft, Netherlands, assignors to Robert F. Frijouf, Tampa, Fla.

Filed Jun. 26, 1989, Ser. No. 371,712
Int. Cl.[5] H02M *5/27*
U.S. Cl. 363—160 **7 Claims**



1. An improved resonant converter for transferring electrical power between a first, second and third input and a first, second and third output, comprising:

a series resonant circuit including a capacitor and an inductor connected in series;

first, second and third bidirectional input switch means connecting the first, second and third inputs to said series resonant circuit, respectively;

first, second and third bidirectional output switch means connecting the first, second and third outputs to said series resonant circuit, respectively;

first, second and third input capacitor means connected to the first, second and third inputs, respectively;

first, second and third output capacitor means connected to the first, second and third outputs, respectively; and

means connecting said first, second and third input capacitor means to said first, second and third output capacitor means for enabling only six bidirectional switches to interconnect the first, second and third inputs to the first, second and third outputs.

5,010,472

CUSTOMER PARTICIPATORY ELEVATOR CONTROL SYSTEM

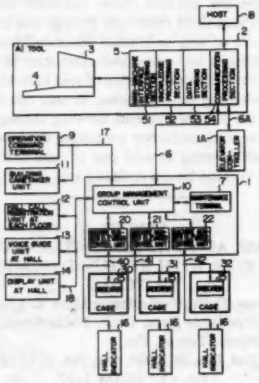
Kenzi Yoneda; Takaaki Ueshima; Soshiro Kuzunuki, all of Katsuta; Yuzo Morita, Hitachi, and Toshimitsu Tobita, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 17, 1989, Ser. No. 311,952
Claims priority, application Japan, Mar. 4, 1988, 63-49536
Int. Cl.[5] G05B *13/02, 17/42;* **G09C** *15/00;* **B66B** *3/00*
U.S. Cl. 364—148 **7 Claims**

1. A customer participatory elevator control system for use in an elevator system having a plurality of elevators serving a

plurality of floors, means for storing predetermined specification information necessary to operate said elevators, and means for controlling the operation of said elevators on the basis of said predetermined specification information, said control system comprising:

means for setting and storing information necessary to operate said elevators on a trial basis;



means for rewriting the contents of said predetermined specification information storing means into trial operation information;

means for controlling a trial operation of said elevators on the basis of the trial operation information; and

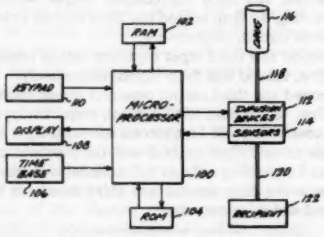
means for analyzing results of the trial operation and restoring the original contents of said predetermined specification information storing means in response to said analyzed results.

5,010,473

METHOD AND APPARATUS FOR MODEL-BASED CONTROL OF AN OPEN-LOOP PROCESS

James R. Jacobs, Durham, N.C., assignor to Duke University, Durham, N.C.

Filed Aug. 31, 1989, Ser. No. 401,996
Int. Cl.[5] G05B *13/04*; A61M *5/172*
U.S. Cl. 364—150 **22 Claims**



1. A method for controlling a process to obtain a specified output, O_p, where the process is described by a linear model that defines an output of the process as a function of a specified control signal, wherein the control signal controls an actuator that affects the process, said method comprising the steps of:

(a) arbitrarily selecting a first value, X_1, and a second value, X_2, for the control signal, and initializing a plurality of state variables in the model;

(b) as a function of the first and second values of the control signal, which are respectively input to the model, determining corresponding first and second output values, O_1 and O_2, that would be obtained at the end of an interval of time, Δt, were the control signal to be applied for this interval;

(c) interpolating with respect to the first and second values of the control signal and corresponding first and second output values to determine a desired value, X_d, for the control signal that should produce the specified output, O_p, at the end of the time interval, Δt;

(d) for the time interval, Δt, operating the process using the desired value, X_d, determined in step (c) for the control signal;

(e) determining a value, X_a, of the control signal actually used by the actuator during the time interval, Δt;

(f) using the model, determining a computed value for the output, O_c, as a function of the value of the control signal determined in step (e); and

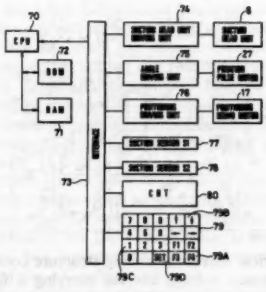
(g) reiteratively repeating steps (b) through (f), each successive iteration using values for the state variables in the model that depend on the computed value of the output determined in step (f) of the previous iteration, so that control of the process tracks changes in the specified output and the process quickly converges on the specified output.

5,010,474

ELECTRONIC PARTS POSITIONING APPARATUS

Shigeru Tsuruta, Ohizumimachi, and Sadao Masuda, Menumamachi, both of Japan, assignors to Sanyo Electric Co., Ltd., Morigushu, Japan

Filed Jan. 17, 1989, Ser. No. 298,178
Claims priority, application Japan, Jan. 19, 1988, 63-8869
Int. Cl.[5] G05B *19/18*
U.S. Cl. 364—167.01 **21 Claims**



1. An electronic parts positioning apparatus for horizontally positioning a chip part held by holding means after a closing operation is effected by relative movement of at least two pairs of opposing positioning pawls, comprising:

setting means for setting information concerning an interval between opposing positioning pawls of each of said two pairs and information concerning a size of said chip part;

memory means for storing the information set by said setting means;

calculating means for calculating a distance for moving relatively said positioning pawls at a high speed and a distance for moving relatively said positioning pawls at a low speed thereafter and for positioning on the basis of the information stored in said memory means; and

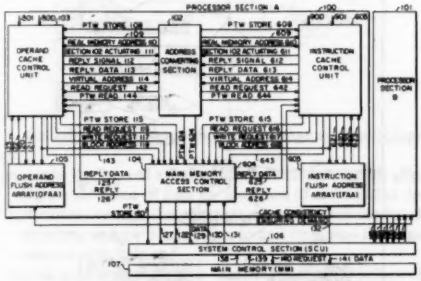
control means for controlling a driving source for driving said positioning pawls toward each other so that said positioning pawls may at first move at the high speed and thereafter move at the low speed, in correspondence with each said distance calculated by said calculating means.

5,010,475

CONSISTENCY ENSURING SYSTEM FOR THE CONTENTS OF A CACHE MEMORY

Osamu Hazawa, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 934,092, Nov. 24, 1986, abandoned. This application Oct. 28, 1988, Ser. No. 264,067
Claims priority, application Japan, Nov. 25, 1985, 60-265781
Int. Cl.[5] G06F 15/16
U.S. Cl. 364—200 4 Claims



1. A consistency ensuring system having at least one main memory and a plurality of processors, each of said plurality of processors having a corresponding instruction cache memory and a corresponding operand cache memory wherein each of said plural processors comprises:

flush address array means for keeping a copy of an address array to be looked up and for invalidating a block of data in the corresponding instruction cache memory or the corresponding operand cache memory in response to storing a corresponding block of data into said main memory from a non-corresponding processor;

address converting means for converting a virtual address to a real address and for updating a page table word after address conversion resulting in an updated page table word and storing the updated page table word in said main memory and not in said corresponding instruction cache memory and said corresponding operand cache memory;

signal generating means for generating a page table word store notice signal when said address converting means stores said updated page table word into said main memory; and

flush address array invalidating means for looking up and invalidating, in response to said page table word store notice signal and a real memory address of said page table word from said corresponding processor, the corresponding block of data in the corresponding instruction cache memory and the corresponding operand cache memory of said corresponding processor,

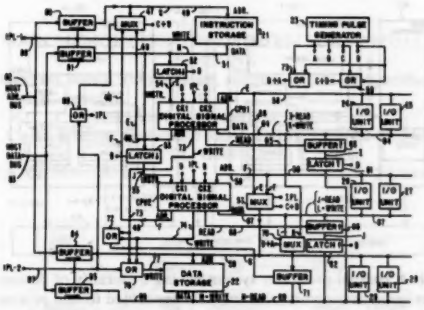
wherein whenever an instruction is stored in the corresponding instruction cache memory and the main memory, said instruction cannot be stored in the corresponding operand cache memory and, whenever an operand is stored in the corresponding operand cache memory and the main memory, said operand cannot be stored in the corresponding instruction cache memory.

5,010,476

TIME MULTIPLEXED SYSTEM FOR TIGHTLY COUPLING PIPELINED PROCESSORS TO SEPARATE SHARED INSTRUCTION AND DATA STORAGE UNITS

Gordon T. Davis, Boca Raton, Fla., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 20, 1986, Ser. No. 876,625
Int. Cl.[5] G06F 13/14, 13/40, 9/38
U.S. Cl. 364—200 5 Claims



1. A digital information processing system comprising:

at least two digital processors;

an instruction storage mechanism for storing processor operating instructions;

a first multiplexing mechanism for coupling the processors to the instruction storage mechanism in a time multiplexed manner for enabling each processor to have a periodic regularly occurring turn at accessing the instruction storage mechanism;

a separate data storage mechanism for storing data separate from said mechanism for storing processor operating instructions;

and a second multiplexing mechanism for coupling the processors to the data storage mechanism in a time multiplexed manner for enabling each processor to have a periodic regularly occurring turn at accessing the data storage mechanism;

each digital processor being a pipelined processor having an instruction fetching mechanism, an instruction decode mechanism and an execution mechanism;

each digital processor having an address bus port and a data bus port for the instruction fetching mechanism;

each digital processor having an address bus port and a data bus port for the execution mechanism;

the first multiplexing mechanism including means for coupling the address bus ports and the data bus ports for the instruction fetching mechanisms to the instruction storage mechanism so that each instruction fetching mechanism is given a periodic regularly occurring turn for purposes of accessing the instruction storage mechanism;

and the second multiplexing mechanism includes means for coupling the address bus ports and the data bus ports for the execution mechanisms to the data storage mechanism so that each execution mechanism is given a periodic regularly occurring turn for purposes of accessing the data storage mechanism.

5,010,477

METHOD AND APPARATUS FOR TRANSFERRING VECTOR DATA BETWEEN PARALLEL PROCESSING SYSTEM WITH REGISTERS & LOGIC FOR INTER-PROCESSOR DATA COMMUNICATION INDEPENDENTS OF PROCESSING OPERATIONS

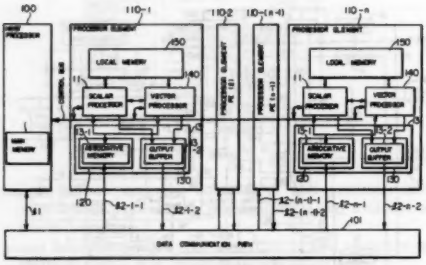
Koichiro Omoda, Sagamihara; Teruo Tanaka, Hachioji; Junji Nakagoshi; Naoki Hamanaka, both of Tokyo, and Shigeo Nagashima, Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 15, 1987, Ser. No. 109,293

Claims priority, application Japan, Oct. 17, 1986, 61-245241; Oct. 29, 1986, 61-255663

Int. Cl.[5] G06F *7/02, 15/347, 15/16, 9/38*

U.S. Cl. 364—200 12 Claims



1. A parallel processor system having a plurality of processors and a data communication path connected to said processors for transmitting data between said processors, each of said processors comprising:

(a) a memory for storing data and for storing instructions, the data including a plurality of vector data each comprising a set of vector elements, and the instructions comprising vector instructions;

(b) a plurality of vector registers connected to said memory, each vector register storing vector data, receiving vector data from said memory and providing vector data to said memory;

(c) operation means, connected to said vector registers, for performing an operation on vector data read from one of the vector registers, and for providing vector data obtained as a result of the operation to one of the vector registers;

(d) a data receiver connected to said data communication path for receiving vector data from said data communication path, the vector data being transmitted by another processor;

(e) a data transmitter connected to said data communication path for transmitting vector data to be processed by another processor to said data communications path; and,

(f) control means, connected to said memory, said vector registers, said data transmitter, and said data receiver, for controlling vector data reading from and vector data writing into said vector registers, said control means including execution means, responsive to a vector instruction of a first kind, fetched from said memory for reading first vector data from a first register of said vector registers designated by the vector instruction and for providing the first vector data to said data transmitter to be transmitted thereby, and the execution means further being responsive to a vector instruction of a second kind, fetched from said memory for writing into a second register of said vector registers designated by the vector instruction, second vector data received by said data receiver.

5,010,478

ENTITY-ATTRIBUTE VALUE DATABASE SYSTEM WITH INVERSE ATTRIBUTE FOR SELECTIVELY RELATING TWO DIFFERENT ENTITIES

Roger L. Deran, 1958 Menalto Ave., Menlo Park, Calif. 94025

Continuation of Ser. No. 850,961, Apr. 11, 1986, abandoned.

This application Aug. 2, 1989, Ser. No. 393,093

Int. Cl.[5] G06F *15/417*

U.S. Cl. 364—200 7 Claims

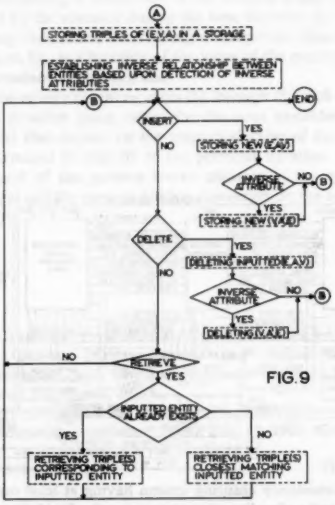


FIG. 9

1. In a database management system having storage means, editor means, input means, and display means, a machine-implementing method comprising the steps of:

storing a plurality of triples in said storage means, each said triple includes an entity, an atribute of said entity, and a value of said attribute; each of said triples are arranged in a predetermined order according to relative significance of said entities, each of said triples having a common entity are arranged sequentially in said predetermined order according to relative significance of the corresponding attributes, each of said triples having the common entity and a common attribute are arranged sequentially in said predetermined order according to relative significance of the corresponding values;

selectively establishing an inverse relationship between one or more of said attributes and another one or more of said attributes in response to one of inputted information from the system and information inputting via the input means;

displaying a sequence of subset of said plurality of triples in said display means;

interactively inputting a new triple with an entity, an attribute, and a value via said input means wherein said attribute of said new triple is inputted explicitly or implicitly;

inserting said new triple into a specified location of said plurality of arranged triples according to eh significance of said entity, said atribute, and said value of said new triple;

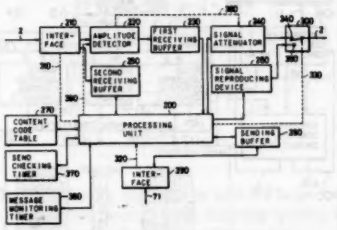
determining by said editor means whether said atribute of said inputted triple has an inverse attribute, and, if so, storing an inverted triple having said value, said inverse attribute, and said entity of said inputted triple into another specified location of said plurality of arranged triples according to the significance of said entity, said attribute, an said value of said inverted triple.

5,010,479

INFORMATION PROCESSING AND STORAGE SYSTEM WITH SIGNAL TRANSMISSION LOOP LINE

Kinji Mori; Yuko Kunai, both of Kawasaki; Masakazu Akiyama, Katsuta; Tadaaki Kadoya, Narashino; Katsumi Kawano, Nerima; Shoji Miyamoto; Makoto Nohmi, both of Kawasaki; Sadanori Shingai, Yokohama, and Hirokazu Ihara, Machida, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 498,553, May 26, 1983, Pat. No. 4,763,254. This application Feb. 22, 1988, Ser. No. 158,698
The portion of the term of this patent subsequent to Aug. 9, 2005, has been disclaimed.
Int. Cl.[5] G06F *3/00, 3/04*
U.S. Cl. 364—200 17 Claims



1. An information processing and storage system comprising:

means in the form of a first signal transmission line for effecting transmission of data for purposes of storing that data;

first means connected to said first signal transmission line for inputting and outputting data to and from said first signal transmission line; and

second means connected to said first means for selectively fetching data from said first signal transmission line via said first means without eliminating the fetched data from said first signal transmission line;

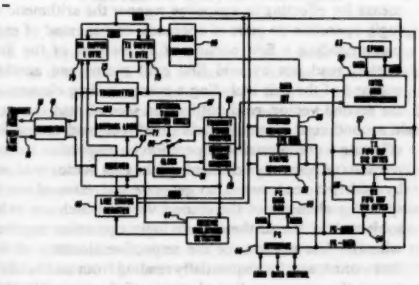
said first means including third means for controlling the storage of data on said first signal transmission line by controlling the period of storage of data on said first signal transmission line in accordance with whether or not said data is fetched by said second means.

5,010,480

COMMUNICATION INTERFACE FOR INTERFACING A DATA BUS OF A COMPUTER TO A HIGH SPEED BIPOLAR COMMUNICATION SYSTEM

T. Raj Natarajan, Plano, Tex., assignor to DSP Technology, Carrollton, Tex.

Filed Jul. 21, 1987, Ser. No. 76,171
Int. Cl.[5] G06F *3/00*
U.S. Cl. 364—200 16 Claims



1. A digital interface for interfacing a Personal Computer data bus directly to a digital service used for transmitting and receiving digital data, the digital interface comprises:

a first digital format receiver interfacible to the digital service and includes a first digital format to a second digital format converter;

a first digital format transmitter interfacible to the digital service and includes a second digital format to a first digital format converter;

transmit buffer operatively connected between the Personal Computer data bus and the first digital format transmitter;

receiver buffer operatively connected between the Person Computer data bus and the first digital format receiver; and

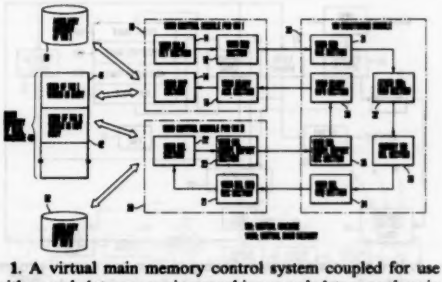
a control system operatively connected to the first digital format receiver, first digital format transmitter, transmit buffer and receiver buffer and includes a clock recovery circuit operatively connected to the first digital format receiver for recovering a clock signal from the digital data having the first digital format.

5,010,481

MAIN MEMORY CONTROL SYSTEM FOR VIRTUAL MACHINE

Tomoyuki Ishida, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Oct. 7, 1988, Ser. No. 254,709
Claims priority, application Japan, Oct. 9, 1987, 62-255842
Int. Cl.[5] G06F *12/08*
U.S. Cl. 364—200 2 Claims



1. A virtual main memory control system coupled for use with a real data processing machine coupled to a real main memory, said real machine having a plurality of virtual data processing machines and said real main memory having a plurality of virtual main memories, each virtual main memory of said plurality of virtual main memories having a dedicated relationship with only one respective virtual machine of said plurality of virtual machines, having a given data storage capacity and providing a storage overload indication when storage requirements of a respective virtual machine are in excess of said given capacity, said virtual main memory control system comprising:

mean for detecting said storage overload indication for one virtual main memory of said plurality of virtual maim memories, having said dedicated relationship with a respective one virtual machine of said plurality of virtual machines having given storage requirements:

means for requesting access to another virtual main memory of said plurality of virtual main memories for said one virtual machine in response to said means for detecting;

means for monitoring said plurality of virtual main memories to locate at least one of said plurality of virtual main memories having an unused given storage capacity sufficient for said given storage requirements of said one virtual machine, in response to said means for requesting;

means for selecting one of said located virtual main memories in response to said means for monitoring, said selected virtual main memory having said dedicated relationship with another virtual machine;

means for releasing said selected virtual main memory from said dedicated relationship with said other virtual machine, in response to said means for selecting to provide availability of said selected virtual main memory;

means for informing said one virtual machine of said availability of said selected virtual main memory, in response to said means for releasing; and

means for supplying access to said selected virtual main memory for said one virtual machine, in response to said means for informing.

5,010,482

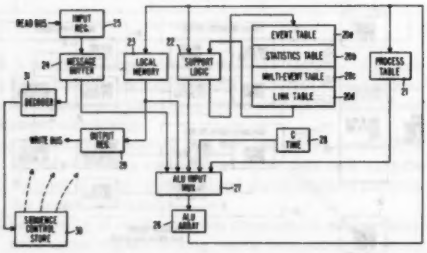
MULTI-EVENT MECHANISM FOR QUEUING HAPPENED EVENTS FOR A LARGE DATA PROCESSING SYSTEM

John A. Keller, Coatesville; Barry S. Traylor, Downingtown, and Robert H. Tickner, Paoli, all of Pa., assignors to Unisys Corp., Detroit, Mich.

Continuation of Ser. No. 68,860, Jul. 2, 1987, abandoned. This application Mar. 23, 1989, Ser. No. 328,812

Int. Cl.[5] G06F 9/46

U.S. Cl. 364—200 **11 Claims**



1. In a processing system having at least one central processor and at least one memory module for storing a plurality of processes to be executed by said at least one processor, which processes require different events to occur before their execution can be completed, a multi-event queuing mechanism comprising:

input means coupled to said at least one central processor to receive a command to allocate one of an event token and a multi-event token to a process currently being executed;

event table means coupled to said input means to store status information about various events designated by allocated event tokens including whether that event token has been allocated and whether that event has occurred;

multi-event table means coupled to said input means and said event table means to store information about various events that have been grouped together designated by allocated multi-event tokens and to form a linked list of such events as each event occurs;

output means coupled to said event table means, said multi-event table means, and to said at least one central processor for transmission of a requested event token received from said event table means and a requested multi-event token received from said multi-event table means; and

control means coupled to said input means, output means, event table means, and multi-event table means to respond to said command and to maintain status of the various event tokens and multi-event tokens including whether they are available.

5,010,483

VECTOR PROCESSOR CAPABLE OF INDIRECT ADDRESSING

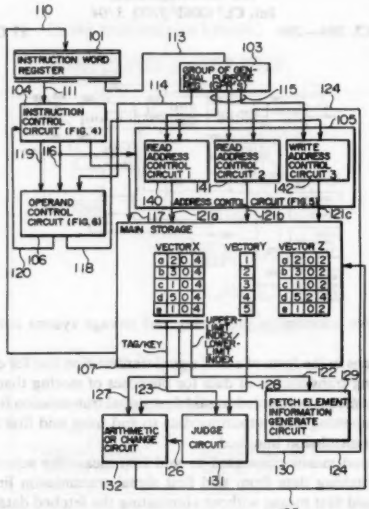
Yusuke Mishina, Kunitachi, and Keiji Kojima, Kodaira, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 7, 1988, Ser. No. 178,913

Claims priority, application Japan, Apr. 8, 1987, 62-84735

Int. Cl.[5] G06F 15/347

U.S. Cl. 364—200 **22 Claims**



1. A vector processing apparatus comprising:

means for holding a plurality of vectors each including a plurality of sequential elements;

first read means connected to said holding means for sequentially reading from said holding means a group of elements of a first vector in an order of the elements, each element of the first vector including first and second portions, the first portion having data to receive an arithmetic or logic operation, the second portion having an index related to a corresponding element of the second vector which should receive the arithmetic or logic operation together with the element of the first vector;

second read means connected to said holding means for sequentially reading from said holding means a group of elements of the second vector in parallel to reading of the group of elements of the first vector;

operation means connected to said first and second read means for effecting in a pipeline manner the arithmetic or logic operation on pairs of operands, one operand of each pair including a first portion of an element of the first vector, read out by said first read means and another operand of the pair including a corresponding element of the second vector, read out by said second read means;

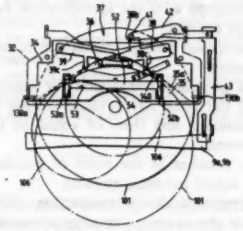
said second read means including indirect read means for effecting a predetermined operation on respective second portions of respective elements of the first vector read out by said first read means, to generate addresses of corresponding elements of the second vector which are to be subjected to the arithmetic or logic operation together with the first portions of the respective elements of the first vector, and for sequentially reading from said holding means the corresponding elements of the second vector based on the generated addresses.

5,010,484

DISC GUIDE MECHANISM FOR AUTOMOTIVE DISC PLAYER

Kazuo Kobayashi; Kiyoshi Morikawa; Yoshinori Yamada; Masakazu Kurumada, and Masanori Sugihara, all of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Mar. 30, 1990, Ser. No. 501,823
Claims priority, application Japan, Mar. 31, 1989, 1-83723
Int. Cl.[5] G11B *3/70, 5/84, 7/26*
U.S. Cl. 369—77.2 1 Claim



1. A disc reproducing apparatus in which a large- or small-diameter disc inserted through a disc inserting opening is transferred to a predetermined position within a player, a clamper arm extending over a turntable on which the disc is placed is operated to fix the disc onto the turntable, and information recorded in the disc is reproduced by rotating the turntable, wherein:

a disc guide plate for guiding the small-diameter disc to a clamp position is pivotally mounted to said clamper arm;

a disc guiding recess into which the small-diameter disc can slip and which has a sufficiently wide opening;

a restraining member for blocking the advancement of only the large diameter disc into the disc guiding recess;

when said small-diameter disc is inserted through the disc inserting opening, said small-diameter disc is advanced into the disc guiding recess to be positioned at the clamp position;

when the large-diameter disc is inserted through the disc inserting opening, the large-diameter disc is guided by said restraining member to the outside of said disc guiding recess such that the large-diameter disc pushes away the disc guide plate to be guided to the clamp position on said turntable.

5,010,485

APPARATUS, SYSTEM AND METHOD FOR CREATING CREDIT VOUCHERS USABLE AT POINT OF PURCHASE STATIONS

Steven T. Bigari, Colorado Springs, Colo., assignor to JBH Ventures, Manitou Springs, Colo.

Filed Jan. 31, 1989, Ser. No. 304,566
Int. Cl.[5] G06F *15/30*
U.S. Cl. 364—408 39 Claims

1. A payment voucher processing apparatus adapted to be used in conjunction with a family of charge cards wherein a customer who has a member charge card can execute a proposed transaction to obtain a guaranteed voucher for a selected maximum charge amount for purchase of goods or services from a merchant wherein a host institution administers customer accounts for the family of charge cards and has verification means for inquiring into the customer account to determine an availability of funds for a proposed charge and issues an approval status signal when funds are available and a disapproval status signal when funds are not available in the customer account, the payment voucher processing apparatus comprising:

a processing means for processing a proposed transaction;

a start means for producing a start signal to initiate a transaction event;

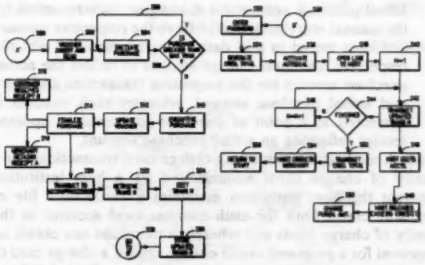
entry means for inputting into said processing means the proposed transaction including account identification data of a member charge card correlated to a customer account administered by the host institution and a maximum charge amount;

means for establishing communication with the host institution;

means for transmitting the identification data and the maximum charge amount to the host institution to interrogate the host institution regarding the availability of funds in customer account at least equal to the maximum charge amount;

receiving means for receiving approval and disapproval signals from the host institution;

said processing means including means responsive to an approval signal for producing a print signal;



voucher producing means responsive to the print signal to produce a voucher indexed with a maximum transaction charge equal to the maximum charge amount, and with the account identification data;

means for storing the account identification data and the maximum charge amount for each approved transaction;

means for retrieving each approved transaction; and

edit means for editing each approved transaction to charge the maximum charge amount to an actual purchase amount whereby the actual purchase amount and the account identification data may be communicated to the host institution by way of the transmitting means.

13. A payment voucher apparatus for use in conjunction with a family of charge cards wherein customers who have a respective member of said family of charge cards can each execute a transaction to obtain a guaranteed voucher for a selected maximum charge amount for use in purchasing goods or services from a merchant wherein a host institution adminis-

ters accounts for the family of charge cards and issues approval/disapproval status signals for a proposed charge and a guarantee of payment of the proposed charge along with approval identifier data when the merchant receives an approval thereof, the payment voucher apparatus comprising:

data transmitting and receiving means for transmitting and receiving data respectively to and from the host institution over a communication line established therebetween;

a microprocessor in communication with said data transmitting and receiving means;

manual entry means for inputting into said microprocessor transaction data corresponding to the proposed charge including the maximum charge amount, said manual entry means including a start key means for initiating the transactions;

an autodialer means responsive to activation of the start key means for automatically opening the communication line with the host institution;

a charge card reader operative to receive a customer's charge card and produce identification data corresponding to the charge card, said identification data transmitted to the host institution by said data transmitting and receiving means over the communication line opened by the autodialer means;

said microprocessor operative in response to input of transaction data from said manual entry means to interrogate the host institution by way of said data transmitting and receiving means in order to obtain the approval/disapproval status for the proposed charge, said microprocessor operative in response to an approval signal and approval identifier data to produce a print signal, said microprocessor including data storage means for storing the identification data and the transaction data for each approved transaction;

a printer operative in response to the print signal to produce a voucher being exchangeable for goods or services of the merchant; said voucher being for an approved charge corresponding to the maximum charge amount, said voucher indexed with transaction identification data, the maximum charge amount and the approval identifier data; and

said microprocessor operative in response to input of the actual purchase amount for the respective transaction by the manual entry means to retrieve the respective transaction data stored in said data storage means and edit the respective maximum charge amount to reflect the actual purchase amount for the respective transaction and store said actual purchase amount, whereby each voucher is corrected at a point of purchase to create an updated receipt reflecting an actual purchase amount.

36. A method for processing charge card transactions for a family of charge cards administered by a host institution wherein the host institution maintains a cardholder file of available credit limit for each member card account in the family of charge cards and wherein a merchant can obtain an approval for a proposed credit charge against a charge card of a customer which charge card is a member of the family of charge cards comprising the steps of:

providing at least one payment voucher producing apparatus at a first location at a facility of the merchant including a data processor with memory;

providing at least one point of purchase sales station at a second location at the facility of the merchant remote from said first location;

entering identification data into said payment voucher producing apparatus corresponding to a respective customer charge card;

entering a maximum charge amount into said payment voucher producing apparatus corresponding to a proposed charge transaction;

electronically transmitting to the host institution over a communication line the identification data and the maximum charge amount correlated thereto;

verifying at the host institution the available credit limit in the member card account corresponding to the respective customer charge card to determine if the credit limit of the member card account to be exceeded;

issuing one of an approval signal if the maximum charge amount does not cause the credit limit to be exceeded while reserving the maximum charge amount in the member card account concurrently with the issuance of the approval signal and a disapproval signal if the maximum charge amount will cause the credit limit of the member card account to be exceeded;

automatically producing a voucher at the payment voucher producing apparatus in response to receipt of an approval signal from the host institution, said voucher being automatically indexed with the identification data and maximum charge amount;

storing the proposed charge transaction in memory of the data processor;

completing a purchase transaction for selected goods or services at the point of purchase station for an actual purchase amount less than or equal to the maximum charge amount;

updating the voucher at the point of purchase station to reflect the actual purchase amount;

editing the proposed charge transaction utilizing the data processor at the payment voucher apparatus to edit the maximum charge amount to an updated charge amount equal the actual charge amount;

electronically transmitting the updated charge amount and the identification data of the respective customer charge card to the host institution; and

retrieving and updating the respective member card account at the host institution to edit the maximum charge amount to the updated charge amount and release the difference therebetween back into the member charge account so that it is again available in the credit limit of the member card account.

5,010,486

SYSTEM AND METHOD FOR LANGUAGE TRANSLATION INCLUDING REPLACEMENT OF A SELECTED WORD FOR FUTURE TRANSLATION

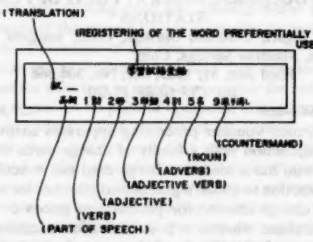
Hitoshi Suzuki; Shinobu Shiotani; Shinji Tokunaga, all of Nara; Tokuyuki Hirai, Yamatokoriyma; Yoji Fukumochi, Nara; Shuzo Kugimiya, Nara, and Ichiko Sata, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 126,263, Nov. 27, 1987, abandoned. This application Feb. 5, 1990, Ser. No. 474,245

Claims priority, application Japan, Nov. 28, 1986, 61-284487; Nov. 28, 1986, 61-284488

Int. Cl.[5] **G06F** *15/38*

U.S. Cl. 364—419 **4 Claims**



1. A translation apparatus for translating an inputted sentence of an original language into a sentence of a target language and for outputting the translated sentence as an outputted sentence, comprising:

indicating means for indicating a selected word contained in the inputted sentence;

dictionary means for storing words corresponding to words of the original language and the targe language;

output means, operatively connected to said dictionary means and said indicating means, for outputting translated equivalent words of the target language from said dictionary means corresponding to said selected word;

input means, operatively connected to said output means, for inputting a desired translated equivalent word correspondign to said selected word, said desired translated equivalent word not being part of the output of said output means;

replacing means, operatively connected to said output means and said input means, for replacing the translated equivalent of said selected word contained in the translated sentence with a translated equivalent word selected from the outputted translated words of said dictionary means or with said new translated equivalent word inputted by said input means; and

means, operatively connected to said replacing means, for preferentially using said translated equivalent word used by said replacing means during future translation processes.

5,010,487

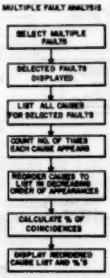
COMPUTER-BASED ENGINE DIAGNOSTIC METHOD

Van T. Stonehocker, Beloit, Wis., assignor to Coltec Industries Inc., New York, N.Y.

Filed Mar. 2, 1989, Ser. No. 317,893

Int. Cl.[5] G01M *15/00*; G06F *15/40*

U.S. Cl. 364—424.03 **4 Claims**


MULTIPLE FAULT ANALYSIS
SELECT MULTIPLE FAULTS
SELECTED FAULTS DISPLAYED
LIST ALL CAUSES FOR SELECTED FAULTS
COUNT NO. OF TIMES EACH CAUSE APPEARS
REORDER CAUSES TO LIST IN DECREASING ORDER OF APPEARANCES
CALCULATE % OF COINCIDENCES
DISPLAY RECORDED CAUSE LIST AND % S

1. A system including a computer and a software program for providing product diagnostic information to a user, said system performing the method comprising the steps of:

storing a list of observable product faults;

storing a list of causes for each observable product fault;

displaying from said list of stored faults a group of two or more observable product faults;

and

in response to a user indication of at least two said observable product faults, displaying in decreasing order by number of occurrences, causes which are common to said user-indication of observed product faults, whereby the most probable cause for said observed product faults occurs at the head of said displayed group of product faults.

5,010,488

REAR-WHEEL CONTROL METHOD FOR A MOTOR VEHICLE WITH A FOUR-WHEEL STEERING SYSTEM

Soichiro Ohshita, and Kazuhiro Fukamachi, both of Oota, Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 15, 1989, Ser. No. 352,839

Claims priority, application Japan, May 16, 1988, 63-118579; Jul. 28, 1988, 63-189084

Int. Cl.[5] B62D *6/00*

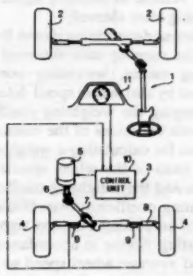
U.S. Cl. 364—424.05 **4 Claims**

1. A method for controlling rear wheels of a four-wheel steering vehicle having a rear-wheel steering control system, comprising the steps of;

detecting rear-wheel slip angle (βr);

providing a transfer function (G(s)) including at least a derivative element;

calculating a desired rear-wheel steering angle (δr) upon an equation based on said rear-wheel slip angle and said transfer function expressed as



$$\delta r = -G(S)\ kr\ \beta r$$

where kr is a steering coefficient; and

applying the desired rear-wheel steering angle to the rear-wheel steering control system for controlling the rear wheels to the desired rear-wheel steering angle.

5,010,489

ANTI-SKID CONTROL SYSTEM WITH A COMMON BRAKING PRESSURE CONTROL DEVICE FOR DIFFERENT WHEELS

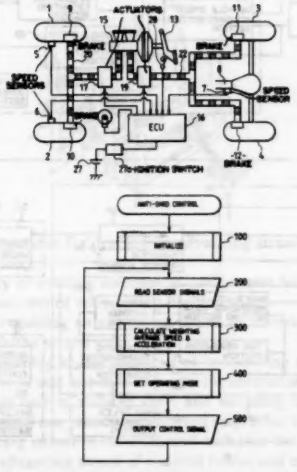
Shouichi Masaki, Chiryu; Akira Fukushima, Kariya; Shusaku Fujimoto, Kariya, and Makoto Nakano, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Apr. 3, 1989, Ser. No. 332,799

Claims priority, application Japan, Apr. 5, 1988, 63-83370

Int. Cl.[5] B60T *8/82*

U.S. Cl. 364—426.02 **12 Claims**



1. An anti-skid control system for use in a motor vehicle having at least first and second wheels and first and second

wheel-braking cylinders, braking pressures applied to said first and second wheel-braking cylinders being adjusted by a single braking pressure adjusting device to become equal to each other, said control system comprising:

first and second wheel speed sensors for respectively detecting rotational speeds of said first and second wheels to output first and second signals indicative of the detected rotational speeds thereof;

running state detecting means for detecting a running state of said motor vehicle to output a signal indicative of the detected running state thereof;

weighting coefficient determining means for determining, on the basis of the running state detected by said running state detecting means, weighting coefficients for the speeds detected by said wheel speed detecting sensors and gradually changing the weighting coefficients thereof in accordance with variations of the running state thereof;

calculation means for calculating a weighted average wheel speed on the basis of the wheel speeds of said first and second wheels and the weighting coefficients determined by said weighting coefficient determining means; and

control means for outputting a control signal to said barking pressure adjusting device in accordance with the calculated weighted average wheel speed so as to control the braking pressure to be applied to said first and second wheel-braking cylinders.

5,010,490

CONSTANT SPEED CONTROL APPARATUS FOR MOTOR VEHICLE

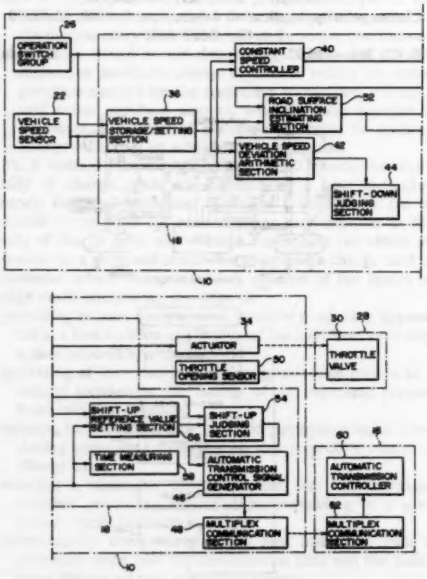
Yasuo Naito; Hiroyuki Kouzuki, both of Himeji, and Takeshi Murai, Hiroshima, all of Japan, assignors to Mitsubishi Electric Corporation, Tokyo and Mazda Motor Corporation, Hiroshima, both of, Japan

Filed Apr. 26, 1989, Ser. No. 343,380

Claims priority, application Japan, Apr. 28, 1988, 63-106142

Int. Cl.[5] B60K *31/00, 41/18*

U.S. Cl. 364—426.04 **15 Claims**



1. A constant speed control apparatus for a motor vehicle, comprising:

setting means for setting a target vehicle speed;

first detection means for detecting a vehicle speed of a traveling vehicle;

shift-down signal output means for, when the detected vehicle speed is decreased from the target vehicle speed to fall outside a predetermined range in a constant speed travel state, outputting a signal to cause an automatic transmission to perform a shift-down operation;

second detection means for detecting that the detected vehicle speed is substantially recovered to the target vehicle speed after the shift-down signal is output;

estimation means for estimating a road surface inclination on a basis of an engine load and the detected vehicle speed; and

shift-up signal output means for, when the detection result by said second detection means and an estimation result of substantially not an uphill by said estimation means are established, outputting a shift-up signal to said automatic transmission.

5,010,491

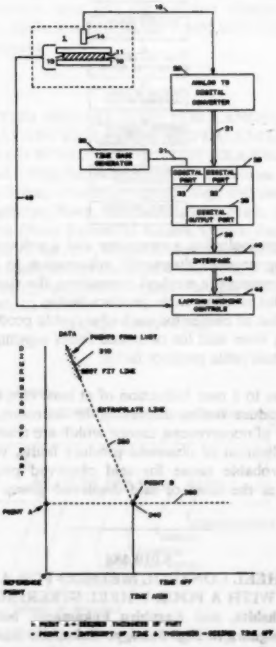
AUTOMATED SYSTEM FOR MACHINING PARTS TO CLOSE TOLERANCES

Alberto Biasillo, Maine, N.Y., and Richard C. Taylor, Warren Center, Pa., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Dec. 27, 1988, Ser. No. 290,588

Int. Cl.[5] G06F *15/46;* **G05B** *19/18*

U.S. Cl. 364—474.28 **15 Claims**



1. A lapping machine control system comprising:

a. means for measuring the relative positions of first and second laps to develop analog signals representing the instantaneous distance between said laps;

b. analog to digital converter means for converting said analog signals to digital form;

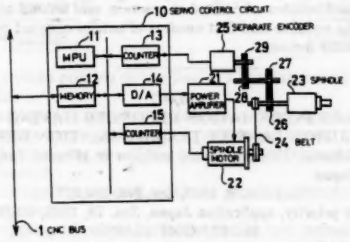
c. control computer means for reading said digital signals as periodic intervals;
d. curve fitting means in said computer means for developing a curve representing the separation of said laps as a function of time;
e. extrapolation mans in said computer means for predicting the point in time when the separation of said laps will reach a desired value; and,
f. means coupled to said extrapolation means for changing mode of said lapping machine when said point in time is reached.

5,010,492

SPINDLE CONTROL SYSTEM AND NUMERICAL CONTROL APPARATUS

Mitsuo Kurakake, Hino, and Jiro Kinoshita, Minamitsuru, both of Japan, assignors to Fanuc Ltd, Minamitsuru, Japan

PCT No. PCT/JP88/00875, § 371 Date Apr. 17, 1989, § 102(e) Date Apr. 17, 1989, PCT Pub. No. WO89/02104, PCT Pub. Date Mar. 9, 1989
PCT Filed Aug. 31, 1988, Ser. No. 343,150
Claims priority, application Japan, Sep. 2, 1987, 62-220013
Int. Cl.[5] G05B *19/407*
U.S. Cl. 364—474.29 **2 Claims**



1. A spindle control system for a numerical control apparatus (CNC) including a CNC bus, a spindle, and a spindle motor which produces pulses, comprising:
a servo control circuit, coupled to the CNC bus, for providing a command, said servo control circuit including:
a microprocessor;
a memory coupled to said microprocessor; and
first and second counters for counting pulses, said second counter coupled to the spindle motor to count the pulses produced by the spindle motor;
a power amplifier, a coupled to said servo control circuit and the spindle motor, for receiving the command from said servo control circuit and for controlling the rotation of the spindle motor; and
a separate encoder, coupled to said first counter and the spindle, for feeding back pulses to said first counter for contour control.

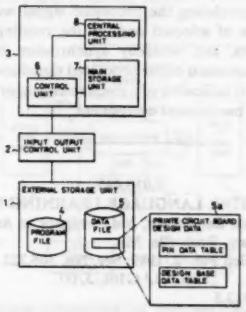
5,010,493

LOAD DISTRIBUTION METHOD

Kenji Matsumoto, Aiko; Tomoatsu Yanagita, Ebina; Yoshinori Nishiyama, Odawara; Masahiko Nagai, Naka, and Mitsuru Morikuni, Ebina, all of Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Computer Engineering Co., Ltd., Kanagawa, both of, Japan

Filed Apr. 26, 1989, Ser. No. 343,362
Claims priority, application Japan, Apr. 26, 1988, 63-103553
Int. Cl.[5] G06F *15/60*
U.S. Cl. 364—490 **10 Claims**

1. A load distribution method in which loads are divided into groups and each of plural input pins of integrated circuits of a load is wired continuously with one stroke of a signal transmission line in an order from a driving output pin in each group when wiring for distributing a drive signal from a driving output pin of an integrated circuit to plural input pins of integrated circuits, functioning as loads, which are mounted at given positions on a printed circuit board, the load distribution method comprising:
dividing the loads into groups by equally distributing a number of the loads so as to allow a load capacity to be equal on each of plural signal transmission lines;



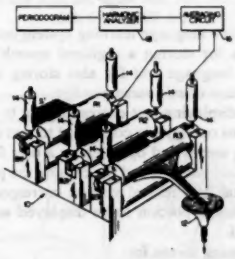
computing a signal propagation delay time of a signal transmission line wired in an equal distance to a load which is equal in a wiring order from the driving output pin in each group; and
grouping the loads by determining a combination of loads in which the signal propagation delay time of the signal transmission line becomes the shortest.

5,010,494

METHOD AND APPARATUS FOR DETECTING MECHANICAL ROLL IMPERFECTIONS IN A ROLLER DRAFTING SYSTEM

Peter R. Lord, Raleigh, N.C., assignor to North Carolina State University, Raleigh, N.C.

Filed Sep. 9, 1988, Ser. No. 242,752
Int. Cl.[5] G01N *27/82*; B21B *37/00*
U.S. Cl. 364—507 **21 Claims**



13. An apparatus for drafting an advancing strand of material, comprising:
a plurality of rotating mechanical components including at least two sets of cooperating drafting rolls,
means for guiding an advancing strand of material serially through the sets of rolls,
means mounting at least one pair of cooperating rolls of at least one of said sets so as to permit the separation between said one pair of rolls to vary, and including means for biasing said one pair of rolls toward each other to grip the advancing strand of material, and such that the thickness of the advancing strand of material causes said one pair of rolls to separate,
means for rotating the rolls within at least one of said sets at

a different surface velocity from that of other sets so as to draft the material passing therethrough,

means for monitoring the separation between said one pair of cooperating rolls,

means for generating a signal representative of the separation between said one pair of cooperating rolls,

means for processing the generated signal so as to identify harmonic components thereof, and

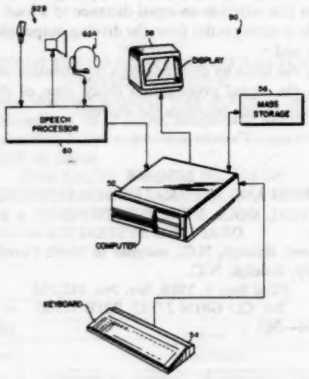
means for correlating the processed signal with rotational frequencies of selected ones of the rotating mechanical components, and whereby synchronism between harmonic components of the processed signal and a rotational frequency is indicative of a mechanical imperfection in the associated mechanical component.

5,010,495

INTERACTIVE LANGUAGE LEARNING SYSTEM

John A. Willetts, Kensington, Md., assignor to American Language Academy, Rockville, Md.

Filed Feb. 2, 1989, Ser. No. 305,223
Int. Cl.[5] G10L *5/00*
U.S. Cl. 364—513.5 **25 Claims**



1. An interactive language learning system comprising:

storing means for storing a digitized speech version of a passage of language and for also storing a digital data textual version of said same passage;

a display for displaying text corresponding to said passage;

selecting means operatively connected to said display and to said storing means and operable by a user for selecting a portion of said passage, and for causing the portion of said stored digital data textual version corresponding to said selected passage portion to be displayed as text on said display; and

speech processing means for:

selecting the portion of said stored digitized speech version corresponding to said selected portion of said passage,

converting said selected digitized speech version portion to audio signals for use in generating speech sounds,

converting audio signals representing user speech into digitized speech signals representing said user speech, and

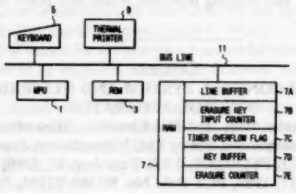
subsequently reconverting said digitized speech signals representing said user speech to audio signals for use in generating further speech sounds so as to permit said user to listen to and compare his own speech with a spoken version of said passage corresponding to said stored digitized speech version.

5,010,496

DOCUMENT PROCESSING SYSTEM

Nobuo Shibazaki, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 14, 1989, Ser. No. 365,719
Claims priority, application Japan, Jun. 17, 1988, 63-148222
Int. Cl.[5] G06K *15/00*
U.S. Cl. 364—519 **8 Claims**



1. A document processing system comprising:

instruction means for instructing, by entry,

erasing means for erasing a printed character;

counter means for counting a first number of entries of said instruction means; and

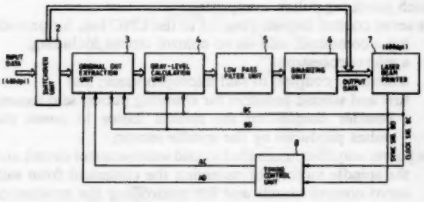
control means for controlling said erasing means to erase a second number of printed characters, said second number being equal to said first number of entries counted by said counter means.

5,010,497

IMAGE INFORMATION RECORDER HAVING A RESOLUTION DENSITY TRANSFORMATION DEVICE

Akira Shimada, Hitachi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 9, 1989, Ser. No. 294,677
Claims priority, application Japan, Jan. 19, 1988, 63-7630
Int. Cl.[5] G06F *15/66*
U.S. Cl. 364—519 **6 Claims**



1. An image information recorder comprising:

printer means, capable of substantially continuous printing in a scanning line direction, for reproducing binary input data of an image having a first resolution density supplied to said printer means as a visual image having a second resolution density in accordance with the binary input data;

original dot extraction means for receiving therein the binary input data in response to a predetermined timing control signal generated on the basis of a synchronizing signal used for scanning and a clock signal from said printer means and for selecting dots from the binary input which contribute to a gray level calculation of a dot in the image to be reproduced in response to the synchronizing signal used for scanning and the clock signal;

gray level calculation means, responsive to the synchronizing signal and the clock signal, for carrying out the gray level calculation in accordance with a predetermined algorithm based on gray levels of the dots selected by said original dot extraction means for converting a result of the gray level calculation into analog form to produce an analog image signal;

low pass filter means for smoothing the analog image signal produced by said gray level calculation means; and

binarizing means for comparing the analog image signal smoothed by said low pass filter means with a threshold signal of a predetermined constant value to produce the binary input data supplied to said printer means.

5,010,498

VIDEO PRINTER

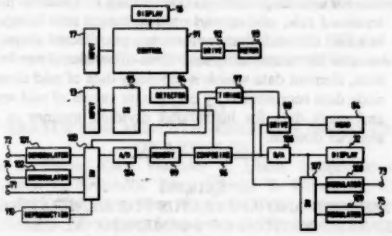
Hidenobu Miyata, Tokyo, Japan, assignor to GFK GmbH, Nuremberg, Fed. Rep. of Germany

Filed Sep. 29, 1989, Ser. No. 414,509

Claims priority, application Japan, Oct. 4, 1988, 63-130354[U]

Int. Cl.[5] G06K *15/00*

U.S. Cl. 364—519 **18 Claims**



1. A video printing device having a housing and comprising therein:

input means adapted to receive main video signals;

memory means connected to said input means, for selectively storing one of said main video signals and a portion thereof;

video signal generating means for generating auxiliary video signals;

composing circuit means connected to said memory means and to said video signal generating means, for receiving and selectively composing said main video signals and said auxiliary video signals;

display means connected to said composing circuit means for display information according to output signals of said composing circuit means;

printing means connected to said composing circuit means for printing information according to the output signals thereof; and

mode selection means connected to said memory means and operable between a passing mode condition in which said memory means is switched so as to be inoperative and said composing circuit means receive said main video signals from said input means without temporary storage in said memory means, and a second mode condition in which said memory means is switched so as to operative and said composing circuit means receive main video signals stored in said memory means.

5,010,499

DIGITAL DATA CAPTURE FOR USE WITH TV SET OR MONITOR

Keen Y. Yee, 57 Ogden Ave., White Plains, N.Y. 10605

Continuation of Ser. No. 158,592, Feb. 22, 1988, Pat. No. 4,894,789. This application Oct. 30, 1989, Ser. No. 429,078

The portion of the term of this patent subsequent to Jan. 16, 2007, has been disclaimed.

Int. Cl.[5] H04N *7/10*

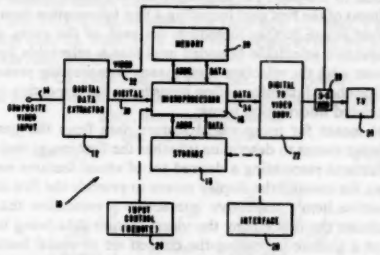
U.S. Cl. 364—521 **16 Claims**

1. A digital data capture apparatus used by a receiving party and operating in combination with a receiving tv set or monitor having associated therewith an extraction circuit for extracting digital data from a composite video-digital signal received by said tv set or monitor comprising:

a tv set or monitor receiving a composite video-digital signal,

means associated with said tv set or monitor for receiving a composite video-digital signal, said signal including digital data having no addresses associated therewith,

storage means for storing selected digital data under control of instructions directed to a microprocessor, said selected digital data being selectively extracted from said compoeite signal by said receiving party,



memory means communicating with said microprocessor for storing programs, said selected digital data, and addresses therfor,

a microprocessor for receiving said selected digital data from said extraction circuit, said microprocessor communicating with said memory means and with said storage means for controlling the selected storage, retrieval, and display of said selected digital data, and

a digital-to-video converter for converting siad selected digital data to video signals suitable for display on the screen of said tv set or monitor.

5,010,500

GESTURE-MODIFIED DIAGRAM FOR RETRIEVAL OF IMAGE RESEMBLING DIAGRAM, WITH PARTS SELECTABLE FOR FURTHER INTERACTIVE RETRIEVAL

Ranjit Makkuni, San Francisco; Frank Zdybel, Jr., and Robert A. Stults, both of Palo Alto, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Jan. 26, 1989, Ser. No. 303,351

Int. Cl.[5] G06F *3/14*

U.S. Cl. 364—521 **24 Claims**

1. An information retrieval system comprising:

presenting means for providing presentations to a user, the presenting means comprising display means for providing visual presentations to the user;

selection input means for providing signals indicating user selections within visual presentations provided by the display means;

gesture input means for providing data basaed on gestures of the user;

memory for storing a plurality of interactive items, the display means being capable of providing a respective interactive presentation based on each of the interactive items; the respective interactive presentations of a first one of the interactive items including a first image, the first image including a plurality of parts including a first part; the memory further being for storing, for each of the parts of the first image, a respective set of related information items based on each of which the presenting means can provide a respective presentation for providing information to the user; the respective set of related information items of the first part including a first information item; the first image further including, for each of the parts, a respective selectable bounded area that is selectable by the user with the selection input means in requesting presentations based on information items from the respective set of related information items;

first means for using visual feature data from the gesture input means to determine whether the first image includes features resembling a desired set of visual features and, if so, for causing the display means to provide the first interactive item's respective interactive presentation that includes the first image; the visual feature data being based on a gesture indicating the desired set of visual features; the visual feature data indicating the gesture's path of motion; and

second means for receiving a request signal requesting the first information item's respective presentation and for responding to the request signal by causing the presenting means to provide the first information item's respective presentation for providing information to the user; the request signal including a selection signal from the selection input means, the selection signal indicating user selection of the first part's respective selectable bounded area.

5,010,501

THREE-DIMENSIONAL GEOMETRY PROCESSING METHOD AND APPARATUS THEREFOR

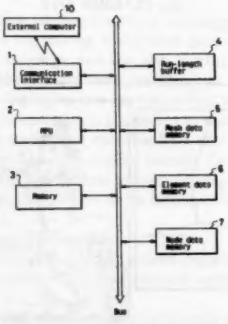
Yoshiki Arakawa, Yawata, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Oct. 19, 1988, Ser. No. 259,826

Claims priority, application Japan, Oct. 20, 1987, 62-264411

Int. Cl.[5] G06F *15/62*

U.S. Cl. 364—522 **3 Claims**



2. A three-dimensional geometry processing apparatus comprising:

a geometry processing computer for creating three-dimensional run-length data representing a three-dimensional object geometry having a surface,

means for dividing an analysis domain enclosing said three-dimensional object geometry into a plurality of elements of three-dimensional geometry having apexes designated as nodes,

means for examining intersection of said elements to said three-dimensional object geometry by using said run-length data,

means for selecting all elements enclosed in said three-dimensional object geometry and all elements intersecting with said surface of said three-dimensional object geometry,

means for creating data of nodes of said selected elements,

means for selecting nodes being present outward from said three-dimensional object geometry of said all elements intersecting with said surface of said three-dimensional object geometry,

means for shifting said nodes being present outward from said three-dimensional object geometry onto the surface of said three-dimensional object geometry on the basis of a first predetermined rule,

means for examining shape of elements which nodes are shifted onto said three-dimensional object geometry,

means for selecting elements conforming to a second predetermined rule, said second predetermined rule being used to select elements that conform to a preselected shape, and

memories for memorizing said three-dimensional run-length data, element data which is topology data of said element, node data represented by coordinate values of said apexes and mesh data for instructing dividing manner of said analysis domain.

5,010,502

METHOD AND APPARATUS FOR GENERATING REPRESENTATIONS OF 3-DIMENSIONAL OBJECTS

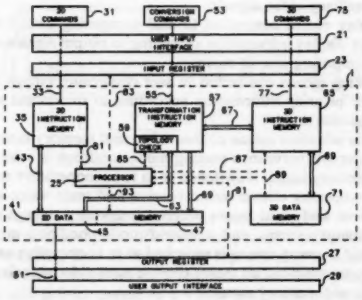
Heinz Diebel, Boeblingen; Ralf Peterhoff, Weil im Schoenbuch, and Evelyn Thuemling, Boeblingen, all of Fed. Rep. of Germany, assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 58,487, Jun. 5, 1987, abandoned. This application Mar. 13, 1990, Ser. No. 494,921

Claims priority, application Fed. Rep. of Germany, Jun. 7, 1986, 86107786

Int. Cl.[5] G06F *15/60*

U.S. Cl. 364—522 **5 Claims**



1. An apparatus for processing a representation of a three dimensional object and for depicting the representation on a display means, comprising:

an input device;

determination means, coupled to the input device for receiving a command from an input device and for determining whether the command is either a 2D command or a 3D command;

2D processing means, coupled to the determination means and selectable thereby in case that the command is a 2D command, for using the command to process the representation in a 2D mode;

2D memory means, coupled to the 2D processing means, for storing two dimensional data regarding the object; the 2D memory means comprising; a first part which is user accessible and which is operative for receiving the 2D view

information; and a second part which is not user accessible and which contains other 2D view information created by a rendering processor;

transformation means, coupled to the determination means and selectable thereby in case that the command is a 3D command, for transforming the two dimensional data stored in the 2D memory means into a three dimensional geometry, the transformation means comprising; a profile processor for transforming 2D geometry into 3D geometry; and the rendering processor for transforming 3D geometry information into 2D view information and for storing the 2D view information in the 2D memory means;

3D processing means, coupled to the transformation means for using the command to process the representation in a 3D mode;

3D memory means, coupled to the transformation and 3D processing means, for storing and receiving three dimensional data regarding the object; and

wherein the display means is coupled to the 2D and 3D memory means for displaying the representation.

5,010,503

APPARATUS FOR ACOUSTIC-EMISSION INSPECTION OF ARTICLES

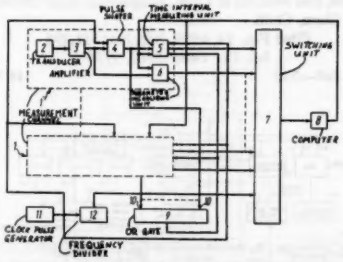
Boris E. Paton, Kiev; Vladimir F. Utkin, Dnepropetrovsk; Anatoly Y. Nedoseka, Kiev; Nikolai T. Khromyak, Kiev; Nikolai V. Gorlitsyn, Kiev; Viktor G. Tikhy, Dnepropetrovsk; Evgeny D. Mezintsev, Moscow, and Nikolai N. Mezhuev, Dnepropetrovsk, all of U.S.S.R., assignors to Institut Elektrosvarki Imeni E.O. Patona Akademii Nauk Ukrainskoi SSR, Kiev, U.S.S.R.

PCT No. PCT/US88/00091, § 371 Date Dec. 19, 1989, § 102(e) Date Dec. 19, 1989, PCT Pub. No. WO89/10560, PCT Pub. Date Nov. 2, 1989

PCT Filed Apr. 20, 1988, Ser. No. 449,854

Int. Cl.[5] G01N *29/04*

U.S. Cl. 364—569 **2 Claims**



1. An apparatus for acoustic-emission inspection of articles, comprising: channels each including a series connection of a transducer of acoustic emission signals, positionable on an article under inspection, and an amplifier of electric signals, having an output connected to a shaper of single pulses and to a unit for measuring parameters of acoustic emission signals, and also a clock pulse generator connected with each channel, a switching unit having inputs connected to outputs of the units for measuring the parameters of acoustic emission signals and also connected with the shapers of single pulses of respective channels, and a computer for processing acoustic-emission data, connected to the switching unit, further comprising, in each channel, a unit for measuring time intervals, having a first input connected to an output of the shaper of single pulses, a second input connected to an output of the clock pulse generator, and an output connected to the input of the switching unit, and also a frequency divider having an input connected to the output of the clock pulse generator and an output connected to the switching unit, and an OR gate having inputs in a number equalling the number of the channels, said inputs of said OR gate being connected to the respective outputs of the shapers of single pulses of each channel, and having an output connected to third inputs of the respective units for measuring time intervals in each channel.

5,010,504

DIGITAL IMAGE NOISE SUPPRESSION METHOD USING SVD BLOCK TRANSFORM

Hsien-Che Lee; Hui-Jung Lee, both of Penfield; Heemin Kwon, Pittsford, and Jeanine Liang, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

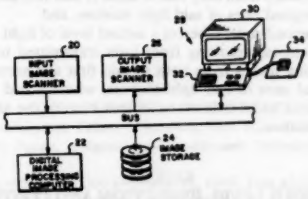
PCT No. PCT/US88/00519, § 371 Date Oct. 12, 1989, § 102(e) Date Oct. 12, 1989, PCT Pub. No. WO89/07799, PCT Pub. Date Aug. 24, 1989

PCT Filed Feb. 22, 1988, Ser. No. 435,490

The portion of the term of this patent subsequent to Jul. 31, 2007, has been disclaimed.

Int. Cl.[5] H03F *1/26*

U.S. Cl. 364—574 **8 Claims**



1. A method of processing an image in a digital computer for reducing noise in the image, comprising the steps of:

(a) generating a nonlinear gain function based upon the measured statistics of the SVD singular values for image noise;

(b) filtering the digital image to produce a detail image and a low pass filtering image;

(c) dividing the detail image into blocks;

(d) transforming the blocks employing an SVD transformation to produce singular vectors and arrays of singular values;

(e) applying the nonlinear gain function to the arrays of singular values to produce arrays of modified singular values;

(f) performing an inverse SVD on the singular vectors with modified singular values to produce blocks of processed detail image values; and

(g) combining the processed image detail values with the low pass filtered image values to produce the processed digital image.

5,010,505

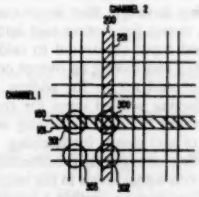
OPTICAL CROSS BAR ARITHMETIC/LOGIC UNIT

R. A. Falk, Renton; C. D. Capps, and T. L. Houk, both of Seattle, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Feb. 27, 1987, Ser. No. 19,761

Int. Cl.[5] G06E *1/04*

U.S. Cl. 364—713 **26 Claims**



3. Apparatus for performing arithmetic operations in residue arithmetic comprising:

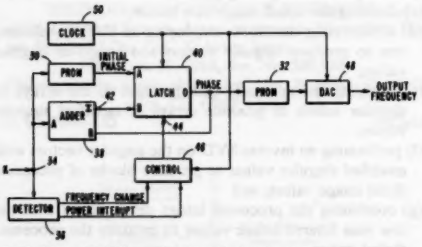
(a) a first plurality of light sources corresponding in number to N wherein N is a given modulus;
(b) a second plurality of light sources corresponding in number to N;
(c) means for energizing a first one of said first plurality of light sources corresponding to the residue of a first number modulo said given modulus;
(d) means for energizing a second one of said second plurality of light sources corresponding to the residue of a second number modulo said given modulus;
(e) means for directing light from said first and second energized ones of said light sources to intersect each other in an intersecting region;
(f) means for detecting light intensity at said intersecting region; and
(g) means for discriminating at said intersecting region between:
(1) a first state, wherein a first level of light intensity is detected resulting from light transmitted to the detecting means from only one or none of said first and second energized ones of said light sources, and
(2) a second state, wherein a second level of light intensity is detected resulting from light transmitted to the detecting means from both of said first and second energized ones of said light sources, wherein said first and second states indicate an output state of the arithmetic operation.

5,010,506

SPURIOUS LEVEL REDUCTION AND CONTROL METHOD FOR DIRECT DIGITAL SYNTHESIZERS

Dennis J. Hrncirik, Hiawatha, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jun. 19, 1989, Ser. No. 369,414
Int. Cl.[5] G06F *15/31*
U.S. Cl. 364—721 **12 Claims**



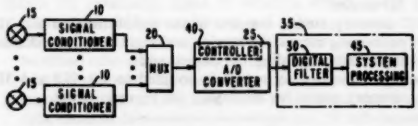
1. A direct digital synthesizer that outputs at least a predetermined output frequency related signal from a received digital signal, K, comprising:
means for permanently storing for continuing reference an initial phase value of the digital signal, K, said means for storing providing said initial phase value on an output thereof;
means for adding having a first input for receiving said digital signal, K, having a second input, and having an output which provides a summation of signals received on said first and second inputs;
means for latching having a first input connected to said output of said means for storing said initial phase value, having a second input connected to said output of said means for adding and having an output connected to said second input of said means for adding, said means for latching also having a third input for receiving a select signal for selecting between receiving on said first and second inputs of said means for latching;
means for detecting changes in predetermined parameters related to spurious signal levels in the output of said direct digital synthesizer and generating a spurious level detect signal;
means for providing said select signal in response to said spurious level detect signal indicative of changes in said predetermined parameters; and
said output frequency related signal being provided on said output of said means for latching.

5,010,507

SAMPLED DIGITAL FILTER SYSTEM

Thomas J. Kenny, Plum Borough, Pa., assignor to Westinghouse Electrical Corp., Pittsburgh, Pa.

Filed Jan. 25, 1989, Ser. No. 301,406
Int. Cl.[5] G06F *15/31*
U.S. Cl. 364—724.01 **6 Claims**



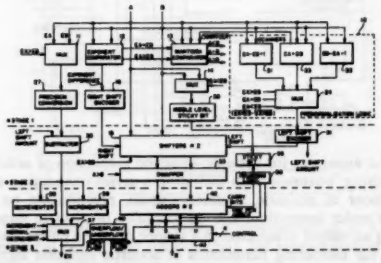
1. A sampled digital filter system for processing an input signal including an unwanted signal component, said system comprising:
sampling means having first and second sampling intervals, for receiving the input signal, for sampling the input signal with said second sampling interval for a limited time within said first sampling interval and for providing samples of the input signal as input samples; and
digital filter means for digital filtering the input samples so as to provide a filtered output corresponding to the input signal with the unwanted signal component filtered out.

5,010,508

PRENORMALIZATION FOR A FLOATING-POINT ADDER

Hon P. Sit, Fremont; David Galbi, Mountain View, and Alfred K. Chan, San Jose, all of Calif., assignors to Intel Corporation, Santa Clara, Calif.

Filed Feb. 14, 1989, Ser. No. 311,294
Int. Cl.[5] G06F *5/01, 7/50*
U.S. Cl. 364—748 **16 Claims**



1. In a floating-point adder for performing a subtraction operation by subtracting a first operand from a second operand to obtain a difference, a prenormalization circuit for prenormalizing mantissas of said operands prior to performing said subtraction operation, comprising:
a first logic circuit coupled to receive mantissas of said operands for logically operating on said mantissas to predict a number of leading 0s in a resultant mantissa of said difference if said exponent value of said first operand is greater in magnitude than said exponent value of said second operand by a value of one;
a second logic circuit coupled to receive mantissas of said operands for logically operating on said mantissas to predict a number of leading 0s in said resultant mantissa if said

exponent value of said second operand is greater in magnitude than said exponent value of said first operand by a value of one;

a third logic circuit coupled to receive mantissas of said operands for logically operating on said mantissas to predict a number of leading 0s in said resultant mantissa if said exponent values of said operands are equal;

shifter means coupled to receive said mantissas of said operands and outputs from said first, second and third logic circuits for shifting said operands to prevent leading 0s from occurring in said resultant mantissa;

wherein said exponent value of said first operand is greater in magnitude than said exponent value of said second operand by a value of one, said shifter means causes each of said operands to be shifted by a number determined by said output of said first logic circuit;

if said exponent value of said second operand is greater in magnitude than said exponent value of said first operand by a value of one, said shifter means causes each of said operands to be shifted by a number determined by said output of said second logic circuit; and

if said exponent value of said operands are equal, said shifter means causes each of said operands to be shifted by a number determined by said output of said third logic circuit;

said shifted operands provide said resultant mantissa which does not require post-normalization.

5,010,509

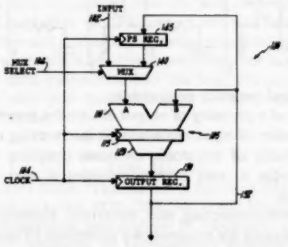
ACCUMULATOR FOR COMPLEX NUMBERS

Roger G. Cox; Mark A. Reber, and Michael W. Yeager, all of Colorado Springs, Colo., assignors to United Technologies Corporation, Hartford, Conn.

Filed Oct. 5, 1988, Ser. No. 253,817

Int. Cl.[5] G06F *7/38, 7/50*

U.S. Cl. 364—748 **3 Claims**



1. An integrated circuit accumulator comprising an adder having first and second input ports, combinational logic means having a set of adder modules for adding first and second input numbers presented to said input ports to form a sum, and an output register means for transferring said sum to said second input port for further addition, said combination logic means being connected between said first and second ports and said output register means characterized in that:

said combinational logic means includes therein first and second portions of combinational logic means and an intermediate storage means connected therebetween, intermediate storage means for storing intermediate data comprising an intermediate form of a partially completed addition operation and having a sum portion containing at least one sum register for storing at least one low order sum bit representing a sum of corresponding low order bits of said first and second numbers, a carry portion for storing a carry bit from the highest one of said at least one sum register and further having a data portion containing at least one pair of data registers for storing high order pairs of bits of said first and second numbers, whereby said adder is divided into said first portion before said intermediate register and said second portion after said register; and

means for loading a third input number into said first input port and means for transferring a fourth input number from said output register means into said second input port when said intermediate data is in said intermediate storage means, whereby said second portion of said adder performs steps in the addition of said first and second numbers and said first portion of said after performs steps in the addition of said third and fourth numbers simultaneously.

5,010,510

MULTIPLYING UNIT CIRCUIT

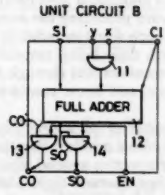
Eiichi Nishimura; Takao Nakamura, and Hisaki Ishida, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Japan

Division of Ser. No. 300,492, Jan. 20, 1989. This application Sep. 7, 1990, Ser. No. 579,343

Claims priority, application Japan, Jan. 25, 1988, 63-14184

Int. Cl.[5] G06F *7/52*

U.S. Cl. 364—758 **4 Claims**



1. A multiplying unit circuit for performing a multiplication operation on a multiplicand input and a multiplier input, comprising:

a one-bit multiplicand input terminal for receiving a one-bit multiplicand input;

a one-bit multiplicand input terminal for receiving a one-bit multiplier input;

a bit multiplication circuit performing bit multiplication on said multiplicand input and said multiplier input to generate a bit product;

a one-bit sum input terminal for receiving a one-bit sum input;

a one-bit carry input terminal for receiving a one-bit carry input;

a full adder for receiving said bit product, said sum input, and said carry input, and performing bit addition thereon to generate a one-bit sum output and a one-bit carry output;

said sum output and said carry output assuming a first state and a second state to represent a binary bit, power consumption being lower in said first state than in said second state;

an enable signal input terminal for receiving enable signals having active state and inactive state; and

a keeping means for keeping said sum output and said carry output in said first state while said enable signal input is in the inactive state.

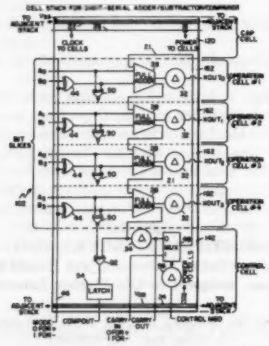
5,010,511
DIGIT-SERIAL LINEAR COMBINING APPARATUS USEFUL IN DIVIDERS

Richard I. Hartley, Schenectady, N.Y., and Peter F. Corbett, Princeton, N.J., assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 182,602, Apr. 18, 1988, Pat. No. 4,951,221. This application Oct. 31, 1988, Ser. No. 265,210

Int. Cl.[5] G06F *7/50, 7/52*

U.S. Cl. 364—786 **58 Claims**



1. Linear combining apparatus for digit-serial first and second operands each having words of W bits simultaneously supplied during respective clock intervals as successive W/n digits of n bits apiece in an efficient arithmetic, n being a plural integer and W being a multiple at least two of n, the less significant digits of each word preceding the more significant digits, the sign bit if any of each word included in its most significant digit, the bits of each digit being respectively identified by consecutive ordinal numbers first through n^{th} in order of their increasing significance, said linear combining apparatus comprising:

a plurality n in number of full adders respectively identified by consecutive ordinal numbers first through n^{th}, each full adder having a respective augend input port for receiving the bits of said first operand digits identified by the same ordinal number as that full adder, each full adder having a respective addend input port for receiving the bits of said second operand digits identified by the same ordinal number as that full adder, each full adder having a carry input port and a sum output port and a carry output port, the carry output port of each of said plurality of full adders except the n^{th} being connected to the carry input port of the one of said plurality of full adders that is identified by the next higher ordinal number;

means for supplying a digit-serial output signal responsive to the bits supplied at the sum output ports of said first through n^{th} full adders;

selection apparatus for selecting a forced carry bit to the carry input port of said first full adder during the first digits of words of said first and second operands and for otherwise selecting the bit supplied at the carry output port of said n^{th} full adder as delayed by one clock interval to the carry input port of said first full adder;

a (n+1)th unit-clock-delay element included in said selection apparatus, having an input port to which the carry output port of said n^{th} full adder connects, and having an output port; and

a multiplexer included in said selection apparatus, having a first input port connected to the output port of said first unit-clock-delay element, having a second input port connected for receiving said forced carry bit, having an output port connected to the carry input port of said first full adder, responding to a control signal being in a first state thereof during all digits of said digit-serial operands except the first digits to select the bit supplied to its first input port to its output port, and responding to said control signal being in a second state thereof during only the first digits of said digit-serial operands to select the forced carry bit supplied to its second input port to its output port; and

selective complementing apparatus for generating said second operands as the equals of or as the one's complements of third digit-serial operands, depending on whether a mode signal is a ZERO or is a ONE, in which said linear combining apparatus said mode signal is applied to the second input port of said multiplexer to cause said linear combining apparatus to be operative as an adder when said mode signal is a ZERO and to be operative as a subtractor when said mode signal is a ONE.

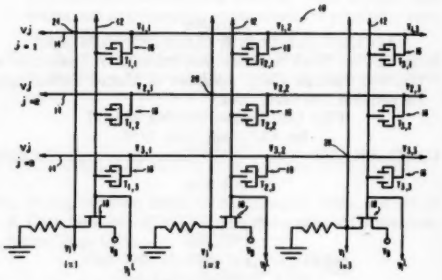
5,010,512
NEURAL NETWORK HAVING AN ASSOCIATIVE MEMORY THAT LEARNS BY EXAMPLE

Allan M. Hartstein, Chappaqua, and Roger H. Koch, Amawalk, both of N.Y., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Jan. 12, 1989, Ser. No. 296,111

Int. Cl.[5] G06G *7/00;* **H03K** *19/08*

U.S. Cl. 364—807 **28 Claims**



1. A neural network comprising;

a matrix of a plurality of output electrodes intersecting with a plurality of input electrodes at intersecting regions, and a plurality of electronic elements coupling said output electrodes to said input electrodes at said intersecting regions;

means interconnecting said electronic elements such that input signals are continuously processed by said electronic elements;

each of said electronic elements comprising an analog threshold device in which its output voltage increases substantially symmetrically in both the positive and negative directions from a threshold voltage as a function of its input voltage.

5,010,513
DATA PROCESSING APPARATUS

Shigeru Ueda, Kamifukuoka, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 704,081, Feb. 21, 1985, abandoned. This application Jul. 6, 1988, Ser. No. 218,485

Claims priority, application Japan, Feb. 24, 1984, 59-33612; Feb. 24, 1984, 59-33613; Feb. 24, 1984, 59-33614; Feb. 24, 1984, 59-33615; Feb. 24, 1984, 59-33618

Int. Cl.[5] G06F *13/00*

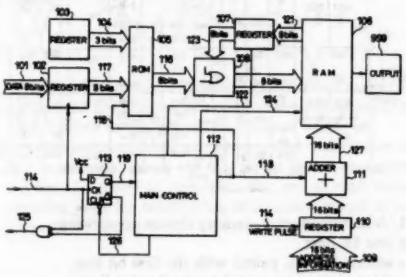
U.S. Cl. 364—900 **7 Claims**

1. A recording apparatus for recording an image transmitted from a host in the form of code data and control data, comprising:

conversion means for converting the code data transmitted from the host into image data;

a first random access memory capable of storing therein the image data converted by said conversion means and the control data, the image data and the control data being stored in accordance with address data transmitted from the host, the address data representing which area of said first random access memory stores the image data and which area stores the control data;

data processing means for conducting write-processing in an overlapping manner on image data previously stored in said first random access memory and on image data newly entered into said apparatus, and for storing the processed data in said first random access memory;



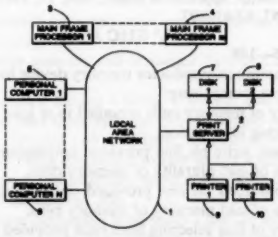
recording means for recording the image data which has been write-processed in the overlapping manner by said data processing means and stored in said first random access memory; and

control means for controlling said data processing means such that said data processing means can conduct the write-processing in the overlapping manner in response to address data transmitted from the host that represents the area of said first random access memory which stores image data and said data processing means cannot conduct write-processing in the overlapping manner in response to address data transmitted from the host that represents the area of said first random access memory which stores control data.

5,010,514
STRUCTURED FIELDS AT A DATA STREAM BOUNDARY FOR DELIMITING FILES

B. William Kippenhan, and Andrew W. Maholick, both of Raleigh, N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 26, 1989, Ser. No. 344,178
Int. Cl.[5] G06F *3/12*
U.S. Cl. 364—900 **10 Claims**



1. In a computer network having a plurality of host processors and microprocessors collectively referred to as sender devices, a plurality of printer devices, and at least one print server referred to as a receiver device, a method for delineating the beginning and the end of a data file sent to a print server for spooling to a target printer device, said method comprising:

sending an inquiry from the sender device to the print server to determine the functional capabilities of the target printer device;

returning a response from said print server to the sender device indicating the functions supported by the target printer device;

appending a beginning of file structured data field to the beginning of the data stream to form a modified data stream to be sent to the print server;

transmitting said modified data stream to said print server;

appending an end of file structured data field to the end of the modified data stream and transmitting said structured field to said print server;

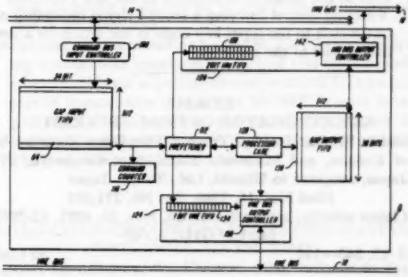
examining and processing said modified data stream to extract the beginning of file and end of file structured data fields; and

sending the file contained in the data stream to the target printer device for printing.

5,010,515
PARALLEL GRAPHICS PROCESSOR WITH WORKLOAD DISTRIBUTING AND DEPENDENCY MECHANISMS AND METHOD FOR DISTRIBUTING WORKLOAD

John G. Torborg, Jr., Carlisle, Mass., assignor to Raster Technologies, Inc., Westford, Mass.

Continuation of Ser. No. 78,874, Jul. 28, 1987, abandoned. This application Sep. 11, 1990, Ser. No. 581,401
Int. Cl.[5] G06F *15/16*
U.S. Cl. 364—900 **31 Claims**



1. An apparatus for generating and manipulating graphic images in accordance with instructions from an operator, transmitted through an input device to a first processor which generates a first, ordered sequence of commands, and sends each command of the first sequence over a command bus to a plurality of graphic arithmetic processors, designated as GAPs, which each has a GAP first in first out (designated as "FIFO") input memory and which GAPs generate together a second sequence of commands that are transmitted over an image memory unit bus (designated as "IMU Bus") to an image memory unit, comprising:

a. for each GAP a command bus input controller for establishing a plurality of GAP arbitration priority levels corresponding to a plurality of degrees of GAP input FIFO emptiness and for arbitrating among the GAPs so that one GAP which has a GAP input FIFO, as compared to which no other GAP's input FIFO is more empty, receives a command of the first sequence;

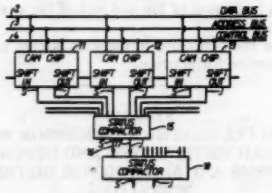
b. for each GAP, means for the command bus input controller to communicate FIFO emptiness signals with the command bus input controller of each other GAP over the command bus; and

c. means for storing order information for all commands of the first sequence which have not yet been executed; and

d. for each GAP, means for transmitting commands of the

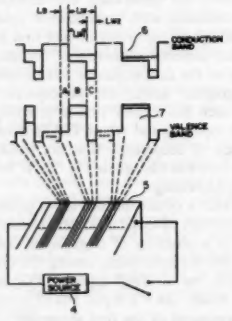
second sequence from said GAP to the image memory unit according to an order based upon the stored order information and substance of the first sequence of commands.

5,010,516
CONTENT ADDRESSABLE MEMORY
Martin Oates, Bedford, England, assignor to Texas Instruments Incorporated, Dallas, Tex.
Continuation of Ser. No. 344,171, Apr. 27, 1989, abandoned, which is a continuation of Ser. No. 142,758, Jan. 11, 1988, Pat. No. 4,852,059. This application Apr. 30, 1990, Ser. No. 517,975
Int. Cl.[5] G11C *15/00*
U.S. Cl. 365—49 3 Claims



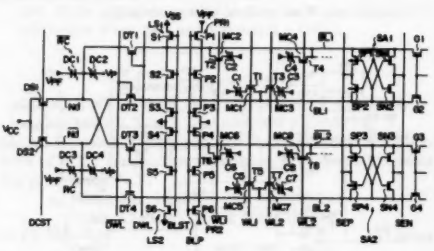
1. A content addressable memory comprising:
A. A memory array adapted to contain plural digits;
B. an input adapted to receive an input key code consisting of plural digits;
C. comparator circuits comparing the plural digits of said key code with the plural digits of said memory array;
D. a first output carrying a first signal indicating the presence in the memory of matches to the key code; and
E. a second output carrying a second signal indicating only one match to the input key code in the whole or a determined part of the memory.

5,010,517
SEMICONDUCTOR OPTICAL APPARATUS
Masahito Migita, Hachioji; Tsuyoshi Uda; Osam Kanehisa, both of Kodaira, and Masatoshi Shiiki, Musashimuraya, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Nov. 16, 1988, Ser. No. 271,681
Claims priority, application Japan, Nov. 18, 1987, 62-289322
Int. Cl.[5] G11C *11/42*
U.S. Cl. 365—114 33 Claims



1. A semiconductor optical device comprising a quantum well super-lattice structure for recording information by receiving light, said structure including a direct transition semiconductor as a component thereof, wherein energy of the light is received in an exciton absorption state of the direct transition semiconductor, and wherein said quantum well super-lattice structure includes a multi-quantum well super-lattice structure (MQW) in which a set of quantum well super-lattice structures are laminated.

5,010,518
SEMICONDUCTOR MEMORY DEVICE
Haruki Toda, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Oct. 16, 1989, Ser. No. 422,051
Claims priority, application Japan, Oct. 19, 1988, 63-263153
Int. Cl.[5] G11C *11/34*
U.S. Cl. 365—145 17 Claims



1. A semiconductor memory device comprising:
a first bit line;
a second bit line, paired with the first bit line;
a third bit line connected to the first bit line;
a fourth bit line paired with the third bit line and connected to the second bit line;
a memory cell array, connected to the bit lines, and containing memory cells;
a first reference cell, connected to the first bit line and the third bit line, including a cell which is formed of substantially the same area, capacity and structure as the memory cells of the memory cell array, and providing a first reference potential at a time of reading out data from the memory cells in the memory cell array; and
a second reference cell, connected to the second bit line and the fourth bit line, including a cell which is formed of substantially the same area, capacity and structure as the memory cells of the memory cell array, and providing a second reference potential at a time of reading out data from the memory cells in the memory cell array.

5,010,519
DYNAMIC SEMICONDUCTOR MEMORY DEVICE FORMED BY 2-TRANSISTOR CELLS
Masahiko Yoshimoto, and Tetsuya Matsumura, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Nov. 4, 1988, Ser. No. 267,328
Claims priority, application Japan, Nov. 17, 1987, 62-291345; Dec. 14, 1987, 62-317807
Int. Cl.[5] G11C *11/40*
U.S. Cl. 365—149 25 Claims

7. A dynamic semiconductor memory device having a small occupied area, comprising:
a plurality of memory cells arranged in at least one column for storing information,
at least one write bit line provided corresponding to each column of said plurality of memory cells,
at least one read bit line provided corresponding to each column of said plurality of memory cells,
a plurality of first selecting lines each provided corresponding to each of said memory cells in said each column,
a plurality of second selecting lines each provided corresponding to each of said memory cells in said each column,

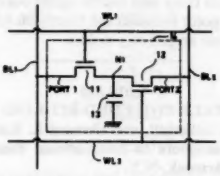
first selecting means for applying a write selecting signal to any of said plurality of first selecting lines, and

second selecting means for applying a read selecting signal to any of said plurality of second selecting lines,

each of said memory cells comprising

capacitance means for storing information,

a first transistor connected between said write bit line and said capacitance means and responsive to said write select-



ing signal applied to corresponding one of said first selecting lines for transferring information applied through said write bit line to said capacitance means, and

a second transistor connected between said read bit line and said capacitance means and responsive to said read selecting signal applied to corresponding one of said second selecting lines for transferring information stored in said capacitance means to said read bit line.

5,010,520

NONVOLATILE SEMICONDUCTOR MEMORY DEVICE WITH STABILIZED DATA WRITE CHARACTERISTIC

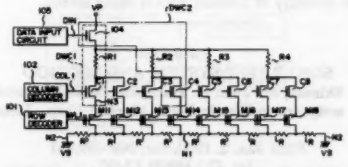
Hidenobu Minagawa, Kawasaki; Yuuichi Tatsumi, Tokyo; Hiroshi Iwahashi, Yokohama; Masamichi Asano, Tokyo; Hiroto Nakai, Kawasaki, and Mizuho Imai, Annaka, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 27, 1988, Ser. No. 224,953

Claims priority, application Japan, Jul. 29, 1987, 62-189433; Nov. 12, 1987, 62-285748

Int. Cl.[5] G11C *11/34, 11/40, 11/412, 17/12*

U.S. Cl. 365—174 **21 Claims**



1. A nonvolatile semiconductor memory device comprising:

a power source;

a nonvolatile memory cell transistor having a drain and a source;

a load transistor having a drain, a source, and a gate, said source of said load transistor being coupled to said drain of said memory cell transistor, said drain of said load transistor being connected to said power source, and said gate of said load transistor being coupled for reception of an input data signal; and

a wiring layer connected in series to a path of said drain and said source of said load transistor and between said power source and said drain of said memory cell transistor, resistance of said wiring layer being larger than a resistance of said load transistor when said load transistor is turned on.

5,010,521

CMOS STATIC MEMORY

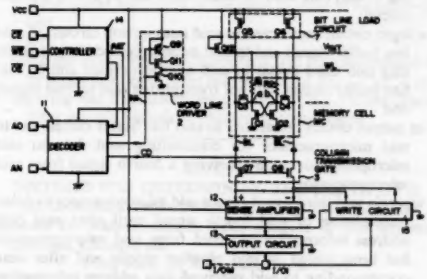
Masataka Matsui, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 1, 1989, Ser. No. 401,811

Claims priority, application Japan, Sep. 6, 1988, 63-223001

Int. Cl.[5] G11C *7/00*

U.S. Cl. 365—189.01 **2 Claims**



1. A CMOS static memory comprising:

a memory cell array constituted by a plurality of memory cells two-dimensionally arranged in word and bit line directions, each of the memory cells being provided with a flip-flop circuit constituted by a pair of pull-down n-type MOSFETs and a pair of pull-up resistor elements, and a pair of transmission gate n-type MOSFETs, a source of each of which is connected to a corresponding one of a pair of output terminals of said flip-flop circuit, a gate of each of which is connected to a word line, and a drain of each of which is connected to a corresponding one of a pair of bit lines; and

peripheral circuits including n-type MOSFETs for performing a write/read operation for each of said memory cells, wherein said pair of pull-down n-type MOSFETs and said pair of transmission gate n-type MOSFETs each have a gate oxide film whose thickness and gate length are less than those of the gate oxide films of said n-type MOSFETs of said peripheral circuits.

5,010,522

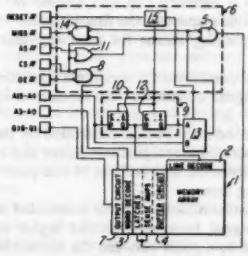
INTEGRATED-CIRCUIT CONFIGURATION HAVING FAST LOCAL ACCESS TIME

Benjamin H. Ashmore, Jr., Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 279,758, Dec. 5, 1988, abandoned. This application Nov. 29, 1989, Ser. No. 443,293

Int. Cl.[5] G11C *11/40*

U.S. Cl. 365—189.07 **37 Claims**



1. An integrated circuit with memory array including:

a pipeline circuit connected to a microprocessor for storing data address information received from a microprocessor upon receipt of a first signal from a microprocessor;

a comparison circuit connected to the input of said pipeline circuit and to the output of said pipeline circuit for generating a second signal if the data address information received from said microprocessor is the same as the data address information stored in said pipeline circuit and for generating a third signal if the data address information received from said microprocessor is different from the data address information stored in said pipeline circuit;

a line buffer circuit for selectively storing data corresponding to said data address information stored in said pipeline circuit;

a logic circuit connected to said comparison circuit, to said line buffer circuit and to said microprocessor for transmitting said third signal to said microprocessor and to said line buffer circuit, but not transmitting said second signal; and

an output circuit connected to said line buffer circuit and to said microprocessor for transmitting said data to said microprocessor upon receiving a fourth signal from said microprocessor;

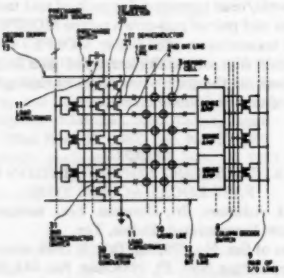
wherein said third signal causes said microprocessor to delay transmission of said fourth signal until after said data address information received from said microprocessor has been stored in said pipeline circuit and after data corresponding to said received data address information has been stored in said pipeline circuit.

5,010,523

SENSING CIRCUIT FOR A DYNAMIC RANDOM ACCESS MEMORY

Hiroyuki Yamauchi, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Japan

Filed Mar. 6, 1990, Ser. No. 488,927
Claims priority, application Japan, Mar. 6, 1989, 1-53099
Int. Cl.[5] G11C *13/00*
U.S. Cl. 365—205 **10 Claims**



6. A sensing circuit for a dynamic random access memory, comprising:

a plurality of pairs of first bit lines capable of being connected to a memory cell and second bit lines complemented with respect to the first bit lines;

a sense amplifying means for receiving and amplifying a signal;

a first signal conductor for sending a first control signal;

a second signal conductor for sending a second control signal;

a first semiconductor switch controlled by the first control signal from said first signal conductor and connected to a point between the first bit lines of said pairs and said sense amplifying means;

a second semiconductor switch controlled by the second control signal from said second signal conductor and connected to a point between the second bit lines of said pairs and said sense amplifying means;

a plurality of pair of third bit lines capable of being connected to a memory cell and fourth bit lines complemented with respect to the third bit lines, and pairs of the third and fourth bit lines being provided across said sense amplifying means from corresponding pairs of the first and second bit lines;

a third signal conductor for sending a third control signal;

a fourth signal conductor for sending a fourth control signal;

a third semiconductor switch controlled by the third control signal from said third signal conductor and connected to a point between the third bit lines of said pairs and said sense amplifying means; and

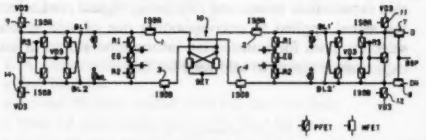
a fourth semiconductor switch controlled by the fourth control signal from said fourth signal conductor and connected to a point between the fourth bit lines of said pairs and said sense amplifying means.

5,010,524

CROSSTALK-SHIELDED-BIT-LINE DRAM

John A. Fifield, Underhill, and Howard L. Kalter, Colchester, both of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 20, 1989, Ser. No. 340,962
Int. Cl.[5] G11C *11/40*
U.S. Cl. 365—205 **11 Claims**



1. A charge storage memory system having a plurality of memory cells arranged in columns and rows, each cell capable of being coupled to a respective one of a plurality of column lines, row select means for accessing memory cells, a plurality of sense amplifiers for sensing stored information associated with memory cells in predetermined columns,

a first plurality of interdigitated column lines associated with a plurality of sense amplifiers,

a second plurality of interdigitated column lines each arranged so as to be physically adjacent to at least one of the first plurality of column lines,

means for sensing information on the first plurality of column lines, and

means for coupling the second plurality of interdigitated column lines to a common source of predetermined potential at least during the time information available on the first plurality of column lines is being sensed.

5,010,525

SONAR TEST SYSTEM AND METHOD

Dale D. Skinner, and John H. Thompson, both of Severna Park, Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 2, 1990, Ser. No. 459,861
Int. Cl.[5] H04B *17/00*
U.S. Cl. 367—13 **9 Claims**

1. Apparatus for testing a transducer array, comprising:

(A) a test transducer;

(B) a drive mechanism for positioning said test transducer over said array;

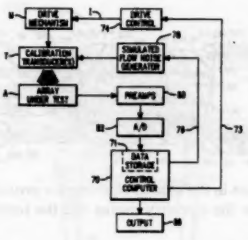
(C) an acoustic coupling medium disposed between said test transducer and said array;

(D) signal generating means for providing said test transducer with a simulated flow noise signal;

(E) said test transducer being operable to transmit a corresponding acoustic signal across said medium toward said array;

(F) means for storing the resultant output signals of all of the transducers of said array in response to receipt of said acoustic signal;

(G) means for providing said drive mechanism with a drive signal to move said test transducer to different predetermined positions over said array for projection of said acoustic signal; and



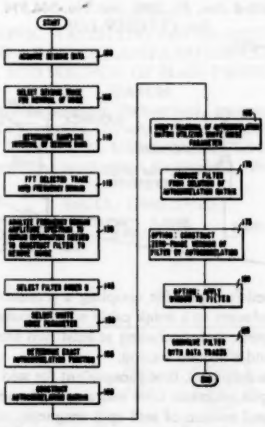
(H) means for combining and processing all of said output signals of the transducers of said array, for all transmissions of said test transducer, to derive an array output response signal for analysis purposes.

5,010,526

METHOD OF DIGITAL FILTERING

Andrew F. Linville, Jr., Dallas, and Thomas E. Shirley, Richardson, both of Tex., assignors to Mobil Oil Corporation, Fairfax, Va.

Filed Jul. 30, 1990, Ser. No. 560,409
Int. Cl.[5] G01V *1/28, 1/36*
U.S. Cl. 367—46 **10 Claims**



6. A method of removing noise components from seismic data recorded in seismic exploration wherein seismic energy sources are activated at spaced locations along a line of exploration, and signals responsive to reflection of the seismic energy within the earth are recorded as a function of time at spaced locations along the line of exploration to produce a series of seismic traces, said seismic traces comprising seismic data components and noise components, said method comprising the steps of:

determining the frequency of energy to be filtered from the records;

choosing the bandwidth of the filter to be applied;

selecting a filter order n;

computing the exact autocorrelation function for one or more bands of energy to be filtered according to the following equation:

$$R_x(\tau) = B\left[\frac{\sin \pi B\tau}{\pi B\tau}\right]\cos(2\pi f_0\tau)$$

wherein:

$R_x(\tau)$ is the exact autocorrelation function of the noise;

B is the bandwidth of the noise to be removed;

f_0 is the center frequency of the band of noise to be removed; and

τ is $0, 1, \ldots n-1$;

using the autocorrelation function $R_x(\tau)$ thus determined to generate a series of filter coefficients $h_0, h_1, \ldots h_{n-1}$; and

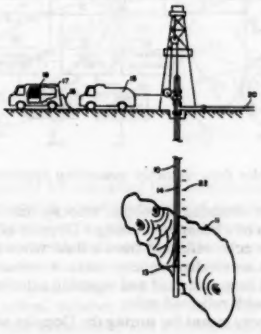
applying said filter coefficients $h_0, h_1, \ldots h_{n-1}$ to the data to filter out the undesired frequency components.

5,010,527

METHOD FOR DETERMINING THE DEPTH OF A HYDRAULIC FRACTURE ZONE IN THE EARTH

Kenneth D. Mahrer, Dallas, Tex., assignor to Gas Research Institute, Chicago, Ill.

Filed Nov. 29, 1988, Ser. No. 277,559
Int. Cl.[5] G01V *1/40*
U.S. Cl. 367—86 **40 Claims**



27. The method of determining the depth of a zone of hydraulic fracture proximate to a wellbore following the application of hydraulic pressure within the bore of a well to cause fracturing in the geological environment around the bore, comprising:

a. while the wellbore is still pressurized, positioning a motion detector at spaced depths within the bore during a time following the cessation of the application of hydraulic pressure, such depths extending vertically beyond at least one vertical limit of the zone of the anticipated vertical extent of the fracture,

b. sensing and recording seismic wave motion for a period of time at each depth, such wave motion having a combined pre-pressurization plus pressure-induced background level with two horizontal components and a vertical component and having motion components from sources not attributable to the fracturing, and having discrete signal components from sources attributable to the fracturing,

c. analyzing such motion recordings at each depth, including

(1) eliminating motion components not attributable to the fracturing,

(2) eliminating discrete signal components from sources attributable to the fracturing,

(3) determining the average background level of the two combined horizontal components and of the vertical component of motion as measured by the motion detector,

(4) and comparing the average background level of motion for the combined horizontal components of motion

to the vertical component of motion, whereby the ratio of the horizontal to the vertical components provides an indication of the presence or absence of fracturing at such depth.

5,010,528

DOPPLER FLOW VELOCITY DISTRIBUTION MEASURING APPARATUS

Shigeo Ohtsuki, 11-7 Chiyoda 4-chome, Sagamihara-shi, Kanagawa 229, and Motonao Tanaka, 4-16 Kunimi 4-chome, Sendai-shi, Miyagi 981, both of Japan

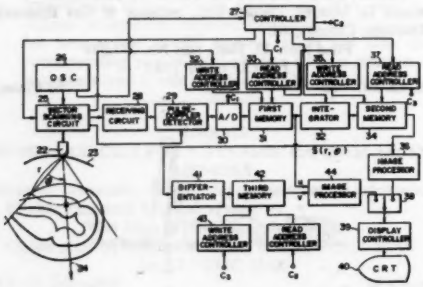
PCT No. PCT/JP89/00659, § 371 Date Feb. 28, 1990, § 102(e) Date Feb. 28, 1990, PCT Pub. No. WO90/00033, PCT Pub. Date Jan. 11, 1990

PCT Filed Jun. 30, 1989, Ser. No. 465,183

Claims priority, application Japan, Jun. 30, 1988, 63-164573

Int. Cl.[5] G01S *15/00*; G01F *1/66*; A61B *8/06*

U.S. Cl. 367—90 **4 Claims**



1. A Doppler flow velocity measuring apparatus, comprising:

a means for obtaining a Doppler velocity distribution in the direction of a beam by utilizing a Doppler effect obtained from the echo reflected from a fluid when an ultrasonic wave or an electromagnetic wave is transmitted to and received from said fluid and scanning a desired transverse section with reflected echo;

a first memory means for storing the Doppler velocity distribution;

a means for obtaining a stream function by reading out the stored Doppler velocity in a direction orthogonal to the direction of said beam and cumulatively integrating said Doppler velocity at each point;

a second memory means for two-dimensionally storing said stream function obtained; and

a means for obtaining the velocity component in the scanning plane which is orthogonal to the direction of said beam by reading out the stream function distribution in the direction of said beam and differentiating said stream function distribution in the direction of said beam.

5,010,529

UNDERWATER TRANSMITTER APPARATUS

Kenneth A. Maynus, 1920 E. Almeria, Phoenix, Ariz. 85006

Filed Apr. 13, 1990, Ser. No. 508,655

Int. Cl.[5] H04B *1/02*

U.S. Cl. 367—137 **15 Claims**

1. Underwater signalling apparatus, comprising, in combination:

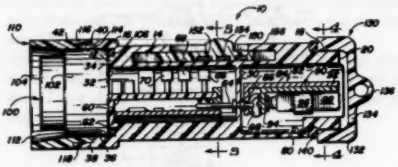
housing means, including a first chamber and a second chamber;

transducer means for providing an audible output at least partially disposed in the first chamber;

circuitry means disposed in the first chamber and connected to the transducer means for providing an output for the transducer means;

first switch means in the first chamber connected to the circuitry means for activating the circuitry means to provide the output for the transducer means;

second switch means on the housing means and movable to actuate the first switch means; and



battery means in the second chamber for providing electrical power for the circuitry means and the transducer means.

5,010,530

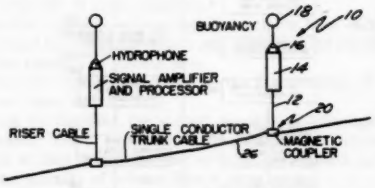
MAGNETIC COUPLER FOR ELECTROACOUSTIC HYDROPHONES

Thomas P. Riley, Westport, Mass., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 26, 1990, Ser. No. 544,574

Int. Cl.[5] G01V *1/38*

U.S. Cl. 367—154 **7 Claims**



1. A magnetic coupler for coupling a plurality of electroacoustic transducers to a trunk cable which comprises:

a split magnetic core including at least two sections, a first section and a second section;

a pair of encapsulants, first encapsulant for said first section of said split magnetic core and a second encapsulant for said second section of said split magnetic core, forming encapsulated first and second sections of said split magnetic core;

fastener means for mounting said first and second encapsulated sections of said split magnetic core around said trunk cable at any preselected points thereof, thus coupling said encapsulated second section of said split magnetic core thereto;

a plurality of electronic processors including power source for supplying power to each of said plurality of electroacoustic transducers;

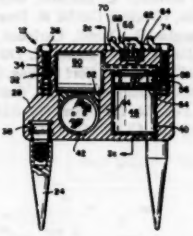
means for connecting an output of a member of said plurality of transducers to a corresponding member of said plurality of electronic processors; and

means for coupling an output of a member of said plurality of electronic processors to said encapsulated first section of said split magnetic core.

5,010,531
THREE-DIMENSIONAL GEOPHONE

William O. McNeel, Houston, Tex., assignor to Western Atlas International, Inc., Houston, Tex.

Filed Oct. 2, 1989, Ser. No. 415,559
Int. Cl.[5] H04R 1/02
U.S. Cl. 367—188 11 Claims

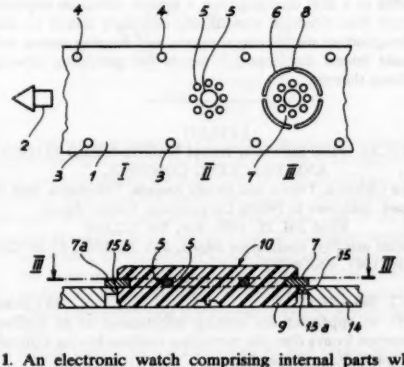


1. An apparatus for detecting transient signals along orthogonal axes, comprising in combination:
(a) a housing;
(b) a plurality of sensors orthogonally disposed within said housing, at least one of the sensors being located above another of the sensors and separated therefrom by a compliant member;
(c) conductor means extending through said housing for interconnecting said sensors to a remote recording unit;
(d) means for substantially sealing said conductor means with said housing; and
(e) means disposed within the sealing means for anchoring the conductor means to the apparatus.

5,010,532
ELECTRONIC WATCH HAVING AN OPENING FOR RECEIVING A BATTERY AND A COVER CLOSING THIS OPENING, AND METHOD OF MASS-PRODUCING THIS WATCH

Friedrich Perrot, Lengnau, Switzerland, assignor to ETA SA Fabriques d'Ebauches, Grenchen, Switzerland

Filed Jun. 27, 1989, Ser. No. 371,942
Claims priority, application Switzerland, Jun. 30, 1988, 02494/88
Int. Cl.[5] G04B 37/00
U.S. Cl. 368—88 28 Claims

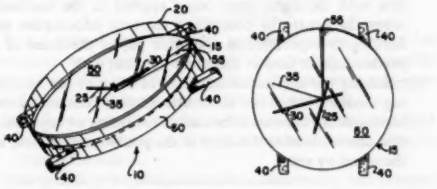


1. An electronic watch comprising internal parts which define a battery housing, at least one external part having an opening for inserting a battery in said housing, and a removable cover having an inner potion engaged in said opening and an outer portion closing said opening, said cover comprising a rigid armature which is at least partially embedded in a packing member made of a flexible and elastic material; said packing member being molded around at least a portion of said armature so that respective parts of said packing member are on inner and outer sides of said armature and anchor said packing member to said armature; said armature being situated at least partly in said outer portion of the cover and bearing at least indirectly and locally against said external part of the watch around said opening; said external part of the watch and said packing member of the cover having respective annular surfaces in contact with one another; and said packing member of the cover being arranged so that its annular surface is pressed against that of said external part of the watch to provide fluid-tight closure of said opening.

5,010,533
DIAL FACE FOR CLOCK OR WATCH

Bruce N. Blackburn, Pelham, N.Y., assignor to Bernard Weinstein, New York, N.Y.

Division of Ser. No. 441,747, Nov. 27, 1989, which is a continuation-in-part of Ser. No. 260,411, Oct. 20, 1988, Pat. No. 4,884,256. This application Mar. 2, 1990, Ser. No. 488,571
Int. Cl.[5] G04B 19/00
U.S. Cl. 368—223 28 Claims



1. An apparatus for indicating time comprising:
(a) a face having a stationary helical member positioned about a central point wherein the distance between any point upon the helical member relative to a horizontal base plane increases along the circumference of said helical member, and a single step member connecting the ends of said helical member to form an indicia from which elapsed time is measured and a continuous surface about said central point; and
(b) means operatively associated with said step member for determining elapsed time;
(c) wherein said time determining means comprises a pair of hands which move relative to said continuous surface whereby the position of said hands relative to said radial edges indicates elapsed time.

5,010,534
OPTICAL INFORMATION RECORDING-REPRODUCING APPARATUS

Masahiko Enari, Yokohama; Satoshi Shikichi; Fumiaki Kawaguchi, both of Tokyo; Kenichi Suzuki; Masayuki Usui, both of Yokohama; Hiroshi Matsuoka, Kawasaki; Kazuhiko Matsuoka; Hideki Hosoya, both of Yokohama; Akio Aoki, Tokyo, and Kazuo Minoura, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 166,802, Mar. 3, 1988, Pat. No. 4,912,697, which is a continuation of Ser. No. 812,995, Dec. 24, 1985, abandoned. This application Aug. 29, 1989, Ser. No. 399,719
Claims priority, application Japan, Dec. 29, 1984, 59-275172; Apr. 19, 1985, 60-84019; Apr. 19, 1985, 60-84111; Jun. 7, 1985, 60-124696
Int. Cl.[5] G11B 7/00
U.S. Cl. 369—32 7 Claims

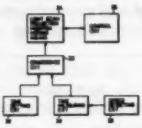
1. A method for intermittently recording and/or reproducing information on or from an optical recording medium hav-

ing a plurality of tracks, in accordance with control of a controller, the method comprising the steps of:

moving a light beam from a home position to a desired track on the recording medium;

effecting information recording or reproduction by scanning the desired track with the light beam;

placing and maintaining the light beam in a stand-by state in which the light beam is applied to the desired track without being returned to the home position, after the termination of the information recording or reproduction;



starting a next information recording or reproduction operation with the light beam being applied to the medium, when the controller commands the next information recording or reproduction operation before the lapse of a predetermined time in the stand-by state; and

terminating the application of the light beam to the recording medium, when the controller gives no command for commencing the next information recording or reproduction operation after the lapse of the predetermined time in the stand-by state.

5,010,535

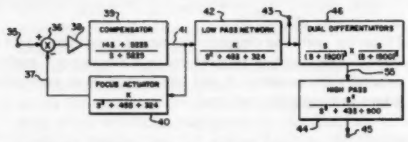
APPARATUS AND PROCESS FOR MEASURING DATA DISK RUNOUT AND ACCELERATION PARAMETERS

Mark L. Davis, Loveland, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jan. 19, 1989, Ser. No. 299,361

Int. Cl.[5] G11B *17/00, 21/10*

U.S. Cl. 369—32 **11 Claims**



11. In a disk drive for exchanging data with a media having circular data tracks through a transducer element which is positioned in proximity to the data tracks for interchanging data information therewith with the physical orientation of the transducer element controlled by a servo loop having a disk drive actuator responsive to an error signal produced by a comparator which compares a reference signal defining a selected transducer-to-track relationship with a signal reflecting an actual transducer position with respect to the track, apparatus for indicating the amount of offset of a selected track from ideal circularity comprising

a low pass filter network including an amplifier and a feedback circuit for simulating a transfer function of the disk drive actuator,

means coupling the error signal to an input of said low pass filter,

amplifying means for receiving an output signal of said low pass filter to amplify said output signal,

means for receiving an output of said amplifying means for indicating the runout of a track corresponding to the reference signal which established the error signal, and

means for adjusting the gain of said amplifying means for calibrating said output thereof.

5,010,536

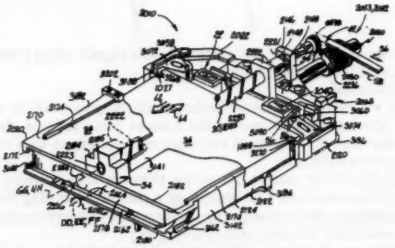
CARTRIDGE HANDLING SYSTEM

Mark E. Wanger; Jennifer L. Methlie, both of Fort Collins; Leslie G. Christie, Greeley; Daniel R. Dauner, Fort Collins, all of Colo.; Douglas R. Domel, Carlsbad, Calif.; David P. Jones, Fort Collins, Colo.; Thomas C. Oliver, Fort Collins, Colo., and Donald J. Stavely, Fort Collins, Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Feb. 22, 1989, Ser. No. 314,012

Int. Cl.[5] G11B *17/22*

U.S. Cl. 369—36 **21 Claims**



1. A cartridge handling system for use in association with a plurality of longitudinally extending rearwardly opening cartridge holding units arranged in a laterally and vertically extending array comprising:

(a) cartridge engaging means for engaging an exposed end portion of a cartridge positioned in an aligned holding unit;

(b) longitudinal displacement means operatively associated with said engaging means for longitudinally displacing a cartridge engaged by said engaging means;

(c) flipping means operatively associated with said engaging means for invertingly rotating a cartridge engaged by said engaging means about a longitudinally extending flip axis;

(d) lateral displacement means operatively associated with said engaging means for laterally displacing a cartridge engaged by said engaging means; and

(e) unitary, rotatable drive means having a drive shaft rotatable in a first direction and a second direction opposite said first direction clutchlessly drivingly linked to said longitudinal displacement means, said flipping means, and said lateral displacement means for providing driving force thereto.

5,010,537

OPTICAL DISC DEVICE WITH MULTI-HEAD SLIDER AND TRACKING CONTROL

Hiroya Ohkuma, Tokyo, and Satoru Sanada, Yokohama, both of Japan, assignors to Nikon Corporation, Tokyo, Japan

Filed Jul. 21, 1988, Ser. No. 222,036

Claims priority, application Japan, Jul. 27, 1987, 62-187236; Sep. 24, 1987, 62-239797

Int. Cl.[5] G11B *7/00*

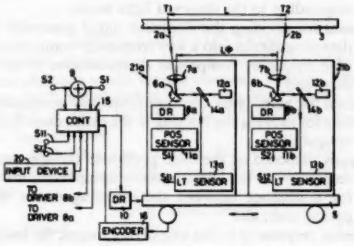
U.S. Cl. 369—44.32 **10 Claims**

1. In an apparatus for writing information to or reading information from a disc-like recording medium having a plurality of tracks formed thereon,

(a) slider means radially movable along said recording medium;

(b) a pair of head means on said slider means, each of said head means having an optical system for applying a light beam to said recording medium, said optical systems hav-

ing respective optic axes that are substantially parallel to each other in a plane substantially radially of said recording medium, said optical systems having means for adjusting the inclination of the light beams in said plane relative to said optic axes, respectively; and



(c) control means for controlling the position of said slider means radially of said recording medium relative to a designated pair of said tracks and for controlling said inclination adjusting means so that said light beams are applied to the tracks of said pair of tracks, respectively, with substantially equal inclinations of said light beams.

5,010,538

FOCUS SERVO APPARATUS

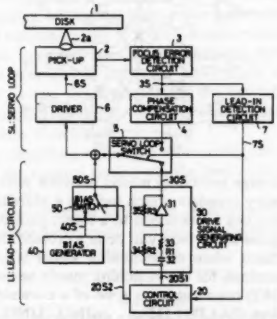
Takayuki Takeda, and Masayasu Satoh, both of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed May 23, 1988, Ser. No. 197,263

Claims priority, application Japan, May 25, 1987, 62-127624; May 25, 1987, 62-127625; May 25, 1987, 62-127626

Int. Cl.[5] G11B *7/00*

U.S. Cl. 369—44.36 **28 Claims**



1. A focus servo apparatus for moving an objective lens from a distant position toward the surface of a disk in an optical disk drive and maintaining the lens in the correct position to focus a beam of light onto the surface of the disk, comprising:

a servo loop for maintaining said objective lens at the position of correct focus, having a lead-in detection circuit for generating an acquisition signal when said objective lens has been moved into the range in which it can be controlled by the servo loop, and a servo loop switch for closing the servo loop in response to said acquistion signal; and

a lead-in circuit means connected to said servo loop, for generating a drive signal to move said objective lens into said range before said servo loop is closed, such that said drive signal abruptly rises from a first level to an initial peak at a second level, then falls to a third level that is between said first and second levels, said drive signal remaining substantially constant at said third level for a period of time greater than it took to change from said first level to said third level.

5,010,539

OPTICAL DISK DEVICE FOR STORING BOTH ANALOG AND DISCRETE DATA AND WHICH UTILIZES BOTH CLV AND CAV TECHNIQUES

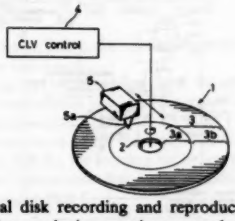
Shigeo Terashima, Tenri; Kentaro Tsuji, Fukuoka, and Hiroshi Fuji, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jan. 26, 1989, Ser. No. 301,583

Claims priority, application Japan, Jan. 29, 1988, 63-20478

Int. Cl.[5] G11B *7/00*

U.S. Cl. 369—50 **8 Claims**



1. An optical disk recording and reproducing device for recording and reproducing continuous analog and discrete data information to or from an optical disk, wherein said optical disk recording/reproducing device comprises:

laser light means for producing an information bearing light beam representing said continuous analog and discrete data information;

analog data processing means for compressing and elongating said analog data information;

discrete data processing means for inserting error correction codes in said discrete data information;

means for recording and reproducing continuous signals received from said analog and discrete data processing means representing said analog and discrete data information separately in different recording regions on said optical disk using said laser light means, wherein said analog and discrete data information are recorded on said optical disk; and

disk rotation control means for controlling the rotation of said optical disk at a given linear speed and rotary angular speed for accessing said divided recording regions;

rotary drive means responsive to said rotation control means for rotating said disk at a predetermined constant linear velocity and constant angular velocity while reproducing and recording information from and to said disk.

5,010,540

APPARATUS FOR RECORDING AND REPRODUCING INFORMATION ON AND FROM AN OPTICAL DISK

Hiroshi Fuji; Tsuneo Fujiwara, both of Tenri; Takashi Iwaki, Nara; Tomiyuki Numata, Tenri; Kentaroh Tsuji, Nara; Shigemi Maeda, Yamatokohriyama; Takeshi Yamaguchi, Nara; Kunio Kojima, Nara; Toshihisa Deguchi, Nara, and Shigeo Terashima, Tenri, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jul. 29, 1988, Ser. No. 225,892

Claims priority, application Japan, Jul. 31, 1987, 62-193119; Jan. 22, 1988, 63-13194

Int. Cl.[5] G11B *15/52, 27/22*

U.S. Cl. 369—50 **5 Claims**

1. In an apparatus for recording and reproducing information on and from an optical disk, having an optical head wherein said optical disk is irradiated by a information bearing light beam, said apparatus comprising:

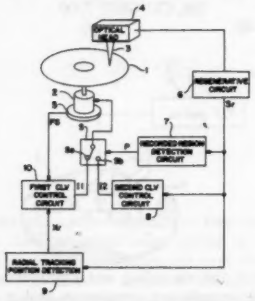
rotational driving means for rotating said optical disk;

reproduction means for reproducing information recorded on said optical disk to output reproduced signals;

position detection means for detecting the radial position of a region of said disk irradiated by said light beam;

first control means responsive to said position detection means for producing a first control signal and for controlling the rotational speed of said rotational driving means using said detected radial position;

judging means for judging whether or not said output reproduced signals are reproduced from a region of said optical disk where information has been already recorded;



second control means for producing a second control signal and for controlling the rotational speed of said rotational driving means, on the basis of said reproduced signals; and

switch means responsive to said judging means for controlling said rotational driving means by said first control signal when said reproduced signals are not reproduced from a region where information has been already recorded, and controlled by said second control signal when said reproduced signals are reproduced from a region where information has been already recorded.

5,010,541

APPARATUS HAVING A MOVABLE PORTION AND A FIXED PORTION FOR REPRODUCING DATA FROM AN OPTICAL DISK BY A LIGHT BEAM

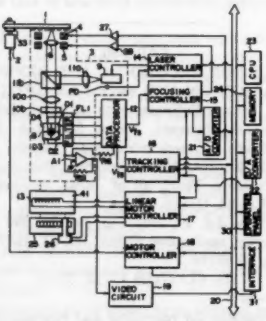
Ryoji Takeuchi, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 23, 1988, Ser. No. 289,128

Claims priority, application Japan, Dec. 26, 1987, 62-330492

Int. Cl.[5] G11B *7/00*

U.S. Cl. 369—107 **13 Claims**



1. An apparatus for reproducing stored data from an optical disk by a light beam, the apparatus having a movable portion and a fixed portion, comprising:

a housing disposed on the movable portion of the apparatus and movable in a radial direction of the optical disk, said housing having

means for directing the light beam onto the optical disk such that at least a portion of the light beam is reflected from the optical disk,

means for detecting the light beam reflected from the optical disk and for generating an electrical signal corresponding to the detected light beam,

means for dividing the electrical signal generated by the detecting means into a low frequency component and a high frequency component representative of the stored data, and

means for amplifying the high frequency component;

means for moving the housing in the radial direction of the optical disk;

means, disposed on the fixed portion of the apparatus and responsive to the low frequency component, for adjusting a distance between the directing means and the optical disk; and

means, responsive to the amplifying means, for outputting the stored data from the optical disk.

5,010,542

MULTI-STAGE SWITCHING NETWORK FOR LIGHT WAVEGUIDES

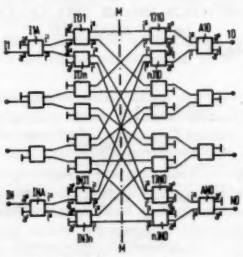
Juergen Pfaff, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Aug. 15, 1988, Ser. No. 232,504

Claims priority, application Fed. Rep. of Germany, Aug. 20, 1987, 3727827

Int. Cl.[5] H04J *14/00*

U.S. Cl. 370—1 **4 Claims**



1. A multi-stage switching matrix network with a plurality of optical binary couplers which include a plurality of terminals and which can be switched to a direct path condition by switching signals and which will be in a crossed through connected condition when no switching signal is present, and which has terminals for the switching matrix network (I1,. . ., IN; 10,. . ., NO) constitutes the tope of a pyramid of optical binary couplers (IA1,I1J1,I1Jn;. . .;nJNO, 1JNO,ANO) said pyramid being provided individually for each of said terminals of the switching matrix network and respectively ending before a cneterline (M—M) of the switching matrix network, in which each optical binary coupler (IA1, I1J1, I1Jn;. . .;nJNO, 1JNO,ANO) has a terminal which is unconnected in one of its two light conducting path (a') on the side not facing a centerline (M—M) of the switching matrix network and which is connected in a light conducting manner beyond the centerline (M—M) of the switching matrix network with every binary coupler pyramid (1J10,nJ10,A10;. . . 1JNO,nJNO,ANO;I1J-1,I1A;. . .;INJ1, INJn, INA) located on the other side, characterized in that, the individual optical binary couplers are connected in a light conducting fashion with the respective binary coupler pyramid (1J10, nJ10, A10; . . .;1JNO, nJNO,ANO; I1J1, I1Jn, I1A;. . .;INJ1, INJn, INA) and beyond the centerline of the switching matrix network such that every switching path of the switching matrix network originating from a switching matrix network terminal (I1,. . .IN) or leading to a

switching matrix network terminal (10,. . .NO) contains a terminal which is unconnected (a') of an optical binary coupler so that if there are no switching signals present a connection will not exist between an input and an output of said switching matrix and the incoming signal is always switched to one of said unconnected terminals unless a switching signal is present.

5,010,543
OPTICAL MULTIPLEXING

Alan M. Hill, Stowmarket, England, assignor to British Telecommunications public limited company, London, England

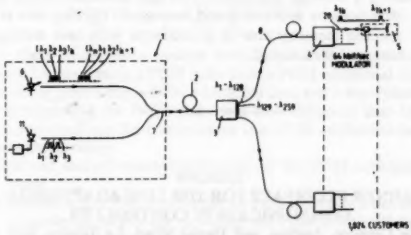
PCT No. PCT/GB88/00460, § 371 Date Feb. 7, 1989, § 102(e) Date Feb. 7, 1989, PCT Pub. No. WO88/10037, PCT Pub. Date Dec. 15, 1988

PCT Filed Jun. 13, 1988, Ser. No. 312,706

Claims priority, application United Kingdom, Jun. 12, 1987, 8713794

Int. Cl.[5] H04J *14/00*

U.S. Cl. 370—3 **17 Claims**



4. An optical communications system having a control station, a first optical path connecting the control station to a node and secondary optical paths connecting the node to two or more receiving stations including:

an optical encoder for an optical communications system comprising an optical source for generating an optical signal corresponding to a time-domain multiplexed signal of two or more information channels having a tuning means arranged to vary the wavelength of the optical signal so that those portions of the optical signal corresponding to a respective distinct channel are generated at a distinct wavelength;

a first transmitting means for transmitting the optical signal from the control station via the first optical path to the node; and

a passive wavelength analyser at the node arranged to direct respective wavelength channels via the secondary optical paths to the receiving stations.

5,010,544
FAULT LOCATION OPERATING SYSTEM WITH LOOPBACK

Ker-Chin Chang, San Jose; Clarence E. Elkins, Pleasant Hill; Paul A. Marshall, Morgan Hill; Duane E. Dunwoodie, Los Altos; Mohamed M. Mansour, Sunnyvale; Paul R. Bauer, Morgan Hill, and Walter A. Lobitz, Westwood, all of Calif., assignors to Wiltron Company, Morgan Hill, Calif.

Filed Jan. 9, 1989, Ser. No. 295,257

Int. Cl.[5] H04J *1/16, 3/14*

U.S. Cl. 370—13.1 **102 Claims**

1. An apparatus for transmitting data from a first terminal to a second terminal, comprising:

a plurality of bidirectional transmission links L_i, for i equal to 1 through N, across which data may be transmitted, each transmission L_i having a first end and a second end, and the plurality including a first transmission link L_1;

test control means, connected at the first terminal to the first end of the first transmission link L_1, for communicating control signals in-band across the first transmission link L_1;

a plurality of repeaters R_i, for i equal to 1 through N−1, each of the repeaters connected to the second end of one transmission link L_i in the plurality and the first end of an other transmission link L_{i+1} in the plurality, and including:

first means for repeating data transmitted from the one transmission link L_i for transmission on the other transmission link L_{i+1},

second means for repeating data transmitted from the other transmission link L_{i+1} for transmission on the one transmission link L_i and

means, responsive to the control signals on the one transmission link L_i, for looping back data transmitted from the one transmission link L_i for transmission on the one transmission link L_i.

5,010,545
ASYNCHRONOUS TIME-DIVISION MULTISERVICE DIGITAL SATELLITE CENTER FOR CONNECTING SUBSCRIBERS

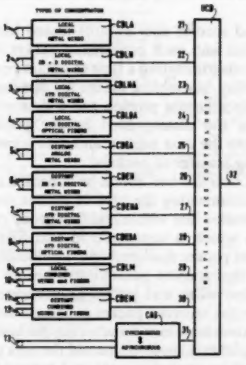
Jean-Baptiste Jacob, Saint-Guay-Perros, France, assignor to Alcatel Cit, Paris, France

Filed Apr. 10, 1990, Ser. No. 507,418

Claims priority, application France, Apr. 13, 1989, 89 04907

Int. Cl.[5] H04Q *11/00*

U.S. Cl. 370—56 **6 Claims**



1. An asynchronous time division multiservice digital satellite center for connecting analog and digital subscribers, the center comprising a digital control unit and digital concentrators of at least one of the following types: local, distant, and versatile distant for connecting subscribers over metal wire lines, with the digital control unit being connected by multiplex links to the concentrators and to a parent digital exchange, wherein said multiplex links are asynchronous multiplex links conveying information packets designated cells, wherein the concentrators are multiservice concentrators delivering information received from subscribers in the form of the cells and transmitting information to subscribers taken from the cells,

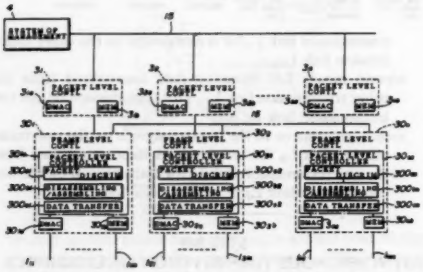
and wherein the digital control unit is a multiservice control unit comprising a multiservice switching network for switching the cells, and connected to the multiservice concentrators and to the parent digital exchange via said asynchronous multiplex links, and a control station connected to the multiservice switching network for controlling said cells.

5,010,546

PACKET SWITCHING SYSTEM

Masaaki Kato, Kasugai, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Jun. 15, 1989, Ser. No. 366,485
Claims priority, application Japan, Jun. 20, 1988, 63-151865
Int. Cl.[5] H04J *3/26*
U.S. Cl. 370—85.11 **14 Claims**



1. A packet switching system comprising:

a plurality of communication lines;

at least first and second data control means respectively connected to first and second groups of said communication lines;

at least first and second packet control means respectively connected to said first and second data control means;

a first bus connecting said first and second packet control means; and

a second bus connecting said first and second data control means,

said first and second data control means having identical construction and each comprising packet discriminating means for discriminating a type of packet received, packet disassembling/assembling means for disassembling a data packet into a header portion and a data portion and for assembling the disassembled header portion and data portion into the data packet, and data transfer means for controlling transfer of packets,

in said first data control means said packet discriminating means discriminating the type of packet received from a communication line within said first group of communication lines which is connected to said first data control means, said packet disassembling/assembling means disassembling the received packet into a header portion and a data portion when said packet discriminating means discriminates the received packet as being a data packet, and said data transfer means transferring the header portion to said first packet control means and the data portion to said second data control means via said second bus,

said first packet control means transferring the header portion to said second packet control means via said first bus, said second packet control means transferring the header portion to said second data control means,

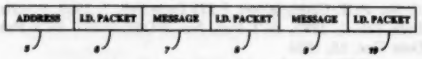
in said second data control means said packet disassembling-/assembling means assembling the header portion received from said second packet control means and the data portion received via said second bus into the data packet, and said data transfer means transferring the assembled data packet on a communication line within said second group of communication lines which is connected to said second data control means.

5,010,547

MULTIPLE MESSAGING USING A SINGLE SELECTIVE CALL ADDRESS

Richard E. Johnson, Lake Worth; Amy R. Kabcenell, Highland Beach, and Joan S. DeLuca, Boca Raton, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 10, 1989, Ser. No. 377,649
Int. Cl.[5] H04J *3/26*
U.S. Cl. 370—94.1 **18 Claims**



1. A method for receiving information by a selected selective call receiver from a single transmission comprising the steps of:

locating message storage instructions in said information; and

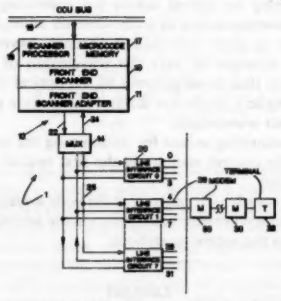
storing a message associated with said message storage instructions by appending said message to existing data in a specific memory area in accordance with said message storage instructions.

5,010,548

SCANNER INTERFACE FOR THE LINE ADAPTERS OF A COMMUNICATION CONTROLLER

Yves Granger, Antibes, and Daniel Wind, La Trinite, both of France, assignors to IBM Corporation, Armonk, N.Y.

Filed Jan. 17, 1989, Ser. No. 297,730
Int. Cl.[5] G06F *13/38*
U.S. Cl. 370—95.1 **8 Claims**



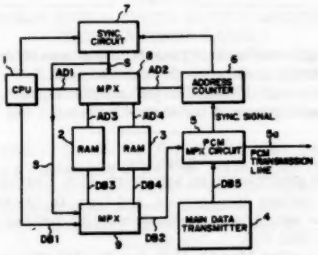
1. A line adapter (1) of a communications controller, for exchanging data and control information between line interface circuits, LICs, (20) connected to external transmission lines (26) and the central control unit, CCU, of the communications controller, said line adapter including, for scanning the lines (26), cyclic scanning means FES (10) exchanging information with the LICs (20) through a bidirectional, inbound-outbound, serial link (12) on which data and control informations are partitioned into frames comprised of data slots and control slots, each pair of data and control slots being dedicated to a determined line (26), line-adapter (1) being characterized in that:

the scanning means FES (10) and serial link (12) are being operated independently according to their own timings, said scanning means including a front end scanner adapter interface, FESA, (11), for interfacing said cyclic scanning means FES (10) with said bidirectional serial link (12).

5,010,549
PACKET DATA GENERATOR

Hiromi Katou, Atsugi, and Hirokazu Kobayashi, Saitama, both of Japan, assignors to Kabushiki Kaisha Kenwood, Tokyo, Japan

Filed Apr. 20, 1989, Ser. No. 340,811
Claims priority, application Japan, Apr. 23, 1988, 63-99350
Int. Cl.[5] H04J 3/12, 3/24
U.S. Cl. 370—110.1 2 Claims



1. Data transmission system including a PCM main data source for generating a PCM main data, a PCM additional data source for generating a PCM additional data and a multiplexer for multiplexing the PCM main data and additional data in a predetermined rate for transmission, said PCM additional data source comprising:

first and second memories for storing the PCM additional data;

a processor unit that is operative in a different rate from said predetermined rate for recruiting the PCM additional data stored in the memories; and

an address counter that is operative in synchronization with said predetermined rate of said multiplexer for generating addresses to be applied to one of said memories;

wherein one of said first and second memories is connected to said address counter and multiplexer so that the PCM input data stored in said one memory is read-out with the addressing by said address counter in synchronization with said predetermined rate and supplied to said multiplexer for transmission; and

the other of said first and second memories in response to a request of requiring a PCM input data to be transmitted, is connected to said processor unit so that the PCM input data stored in the other memory is rewritten with the addressing and data provided by said processor unit operating in said different rate, and in response to the completion of the rewriting is then connected to said address counter and multiplexer in place of said one memory.

5,010,550
TRANSMISSION LINE SWITCHING SYSTEM

Yoshimi Hirata, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Feb. 2, 1989, Ser. No. 305,927
Claims priority, application Japan, Feb. 4, 1988, 63-22916
Int. Cl.[5] G06F 11/20
U.S. Cl. 371—8.2 6 Claims

1. A transmission line switching system, comprising:

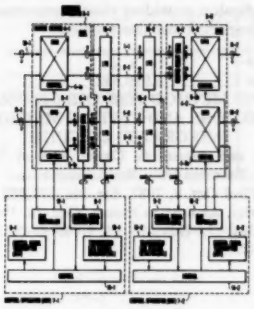
(A) a first plurality of normal transmission lines extending between first and second remote stations;

(B) a second plurality of standby transmission lines extending between said first and second remote stations; and

(C) control means for switching transmission between said normal and standby transmission lines as a function of the condition of said normal transmission lines, said control means;

(1) monitoring the condition of said normal transmission lines;

(2) upon detection of a failure in one of said normal transmission lines selecting one of said standby transmission lines and sending a control signal from said first station to said second station and then back to said first station over said selected standby transmission line; and

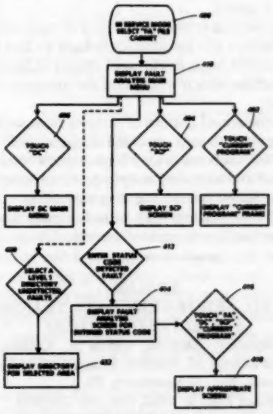


(3) if said control signal is received at said first station and indicates that said selected standby transmission line has not failed, causing transmission to be switched from said failed normal transmission line to said selected standby transmission line.

5,010,551
SELF CONTAINED TROUBLESHOOTING AID FOR DECLARED AND NON DECLARED MACHINE PROBLEMS

Alan Goldsmith, Fairport, and Hugh O. Forbes, Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 14, 1989, Ser. No. 339,462
Int. Cl.[5] G06F 11/00; G01R 31/28
U.S. Cl. 371—16.4 9 Claims



1. In a reproduction machine having a plurality of interactive machine components cooperable to produce copies from document originals including a control having a touch operative user interface and screen display, a self contained method of problem analysis comprising the steps of:

entering into a problem analysis mode in the machine,

providing a portion of the display to manifest a fault code if a machine fault actually exists,

displaying a first plurality of system indicators related to suspected machine problems,

touch entering into the control via the user interface a fault

code number, if a fault code is manifested in said portion of the display, or

touch activating one of the, system indicators and

displaying a second plurality of system indicators related to said one of the systems indicators the second plurality of system indicators providing visual representations to identify said suspected machine problem.

5,010,552

DEVICE AND METHOD FOR THE GENERATION OF TEST VECTORS AND TESTING METHOD FOR INTEGRATED CIRCUITS

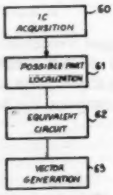
Bernard Dias, and Arnaud du Chene, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Oct. 8, 1987, Ser. No. 107,502

Claims priority, application France, Oct. 10, 1986, 86 14148

Int. Cl.[5] G01R *31/28;* **G06F** *11/22*

U.S. Cl. 371—27 **7 Claims**



1. A method of testing each of a series of integrated logic circuits comprising (FIG. 54)

the steps of

analyzing (60) each type of integrated circuit and determining (61) possible logic faults therein including logic faults caused by the physical structure and relative position of the circuit elements in the integrated logic circuit and how each such logic fault would affect outputs expected to be triggered from said integrated logic circuit by a particular pattern of inputs;

generating (63) and applying to inputs of each circuit at least one test vector per possible logic fault so that said vector applied to said logic circuit will trigger at least one actual output pattern which will reveal the existence of any such logic fault;

comparing the actual pattern of outputs from said integrated logic circuit with said expected outputs, and

indicating, for each integrated logic circuit tested, whether said actual and expected output patterns match;

wherein the fault-determining step comprises

the step of determining (62) cells logically equivalent to actual parts of the integrated circuit.

5,010,553

HIGH SPEED, ERROR-FREE DATA TRANSMISSION SYSTEM AND METHOD

Clifford D. Scheller, Bartlett; Aaron A. Collins, Arlington Heights, and Joseph M. Hansen, Roselle, all of Ill., assignors to Compuquest, Inc., Schaumburg, Ill.

Filed Dec. 5, 1988, Ser. No. 279,914

Int. Cl.[5] G08C *25/00*

U.S. Cl. 371—35 **17 Claims**

1. A method of transmitting data from a transmitter to a receiver with improved throughput comprising the steps of:

formulating data into identifiable packets;

sequentially transmitting said packets to a receiver;

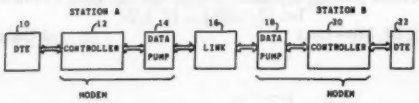
checking for errors in received packets;

loading error-free packets in sequence onto a packet carousel having a fixed number of packet positions;

removing error-free packets in sequence from said carousel;

signaling the identity of a defective packet to said transmitter in a header identifying the number of the packet, the number of total bytes and the number of data bytes in the packet, and error detection information;

maintaining an empty position on said packet carousel for a packet found to be defective;



retaining error-free data packets in positions subsequent to said empty position on said carousel; and

retransmitting said identified packet by interspersing it in the normal sequence of transmitted packets.

5,010,554

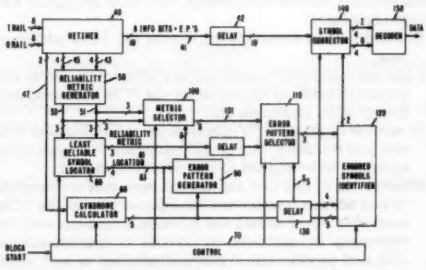
ERROR CORRECTION METHOD AND APPARATUS

Linda K. Bechtel, Newburyport, and Gary D. Martin, North Andover, both of Mass., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed May 12, 1989, Ser. No. 350,494

Int. Cl.[5] G06F *11/10;* **H03M** *13/00*

U.S. Cl. 371—37.1 **20 Claims**



1. Apparatus for correcting block coded data received in the form of discrete symbols that may incorporate one or more errors comprising:

analog-to-digital converting means (20) for converting said received symbols into hard bits corresponding to the received data and soft bits indicative of the proximity of said received symbol values to valid symbol values;

syndrome calculating means (60) responsive to said hard bits for calculating the syndrome of each received coded block;

reliability metric generating means (50) responsive to said soft bits for generating a reliability metric for each received symbol;

error pattern candidate retrieving means (90) responsive to said syndrome for identifying a plurality of error pattern candidates, each such candidate comprising one or more symbols for correction to produce a valid symbol block; and

error correcting means (100, 110, 120, 140) responsive to said error pattern candidates and said reliability metrics for correcting the symbols of one of said identified error pattern candidates to produce the valid symbol block closest to the received symbol values characterized in that;

said data is encoded according to a block code having an over-all parity bit;

said apparatus further comprises:

least reliable symbol identifying means (80) responsive to said reliability metrics for identifying the symbol in each coded block that is closest to a slicing level;

in response to a non-zero even syndrome, said error pattern

candidate retrieving means identifies the complete set of two-symbol errors that can produce the said even syndrome; and

in response to an odd syndrome said error pattern candidate retrieving means identifies the one single-symbol error and the complete set of three-symbol errors, each including said least reliable symbol, that can produce the said odd syndrome.

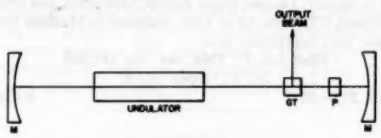
5,010,555
NON-LINEAR INTRACTIVITY OPTICAL DEVICES FOR FREE ELECTRON LASERS

John M. J. Madey, 2120 Amherst St., Palo Alto, Calif. 94306; Stephen V. Benson, 624 Leksich Ave., Mountain View, Calif. 94041; John F. Schultz, 3834 Nimitz St., Eau Claire, Wis. 54701, and Antonello Cutolo, Via Claudio 21, Naples, Italy 80125

Continuation of Ser. No. 338,527, Apr. 14, 1989, abandoned, which is a continuation of Ser. No. 258,081, Oct. 13, 1988, abandoned, which is a continuation of Ser. No. 186,781, Apr. 25, 1988, abandoned, which is a continuation of Ser. No. 921,923, Oct. 22, 1986, abandoned. This application Jul. 25, 1990, Ser. No. 560,461

Int. Cl.[5] H01S *3/00*

U.S. Cl. 372—2 **12 Claims**



1. An improved free-electron laser (FEL) oscillator comprising:

an electron accelerator system which injects a beam of relativistic electrons along an axis;

undulator means for generating a periodic transverse motion of said beam about said axis;

a set of mirrors disposed about said axis defining a resonant optical cavity along said axis, said cavity having an optical length that defines a round-trip cavity transit time; and

a transmissive non-linear optical means mounted on said axis for producing a phase-matched interaction between the optical wave supported by said resonator and a field in the group consisting of an externally applied acoustic field, an externally applied electric field, and the optical wave itself, thereby modulating the amplitude polarization, or wave vector of the optical wave.

5,010,556
A STRIPE-SHAPED HETEROJUNCTION LASER WITH UNIQUE CURRENT CONFINEMENT

Koichi Imanaka, Kyoto, and Hiroshi Imamoto, Takatsuki, both of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Division of Ser. No. 48,616, May 11, 1987, Pat. No. 4,839,307. This application Jan. 13, 1989, Ser. No. 297,025

Claims priority, application Japan, May 14, 1986, 61-108652; Mar. 10, 1987, 62-52964

Int. Cl.[5] H01S *3/19*; H01L *33/00*

U.S. Cl. 372—46 **14 Claims**

1. A semiconductor laser having internal current restriction, comprising:

an n-side electrode and a p-side electrode;

a resonant cavity;

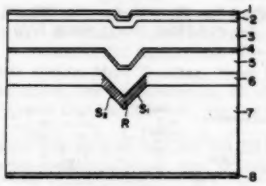
a (100) face-oriented p-type GaAs substrate having a difference in level exposing an (n11) (n=1-5) A face;

an Si-doped $Al_zGa_{1-z}As$ current restriction layer formed on said substrate;

a p-type $Al_yGa_{1-y}As$ cladding layer formed on said current restriction layer;

an active layer formed on said p-type cladding layer;

an n-type $Al_xGa_{1-x}As$ cladding layer having Sn as a dopant formed on said active layer; and



an n^+—GaAs contact layer formed on said n-type cladding layer.

5,010,557
MOBILE RADIO TRANSMITTER USING BAND EXPANDING METHOD

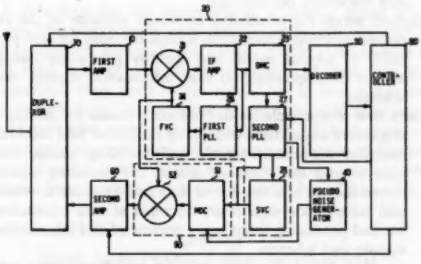
Soon-Ik Chun, Kwachun, Rep. of Korea, assignor to SamSung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Oct. 13, 1989, Ser. No. 421,057

Claims priority, application Rep. of Korea, Oct. 13, 1988, 1988-13356

Int. Cl.[5] H04K *1/04*

U.S. Cl. 375—1 **15 Claims**



7. A transceiver, comprising:

means for converting a first frequency signal received into an intermediate frequency signal, generating a local oscillation frequency, detecting and demodulating said intermediate frequency signal to provide a calling code signal and a demodulated received carrier signal in response to reception of said first frequency signal, and during a transmission mode for generating a clock signal;

means for initiating said transmission mode when said calling code signal contains specific calling information;

means for generating respondent information in response to reception of said clock signal from said demodulator means;

modulator means for receiving the local oscillation frequency, the demodulated received carrier signal and the respondent information, executing a first modulation of said respondent information by use of the demodulated received carrier to produce a first modulated signal, and then mixing the first modulated signal with said local oscillation frequency to produce a second modulated signal; and

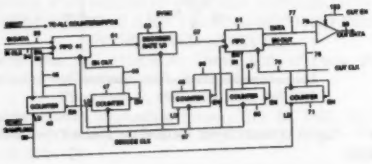
duplexor means for transmitting the second modulated signal from said second amplifier during said transmission mode, and for applying said first frequency signal to said converting means in the absence off said transmission mode.

5,010,558

DATA OVERLAP DECODER

Richard A. Yost, West Melbourne, and David H. Damerow, Palm Bay, both of Fla., assignors to Harris Corporation, Melbourne, Fla.

Filed Sep. 29, 1988, Ser. No. 250,697
Int. Cl.[5] H04L *27/00*; H04B *1/10*
U.S. Cl. 375—37 **10 Claims**



1. For use with a communication system having a transmitter site whereat information signals are encoded at a first encoding rate and transmitted over a communication channel to a receiver site whereat encoded information signals that have been transmitted over said communication channel from said transmitter site are received, an apparatus for recovering said signals comprising:

a plurality of first means, each of which is coupled to receive said encoded information signals, for extracting, at a rate less than said encoding rate, a respective portion of said received encoded information signals that overlaps another portion of said information signals the time of occurrence of which is different from the time of occurrence of said respective portion; and

second means for combining extracted portions of the received encoded information signals decoded by said plurality of second means and thereby producing output signals corresponding to said information signals; and wherein

each first means includes first memory means for storing a respective sequential overlapping portion of said received encoded information signals, and decoding means, coupled to said first memory means, for decoding signals stored therein at a rate lower than said first rate at which said information signals are encoded at said transmitter site and producing therefrom a portion of said information signals; and wherein

each of said first means includes means for writing said respective overlapping portion of said received encoded information signals into said first memory means at a rate corresponding to the data rate of said received signals, and for coupling the contents of said first memory means to said decoding means at a clock rate corresponding to said lower rate.

5,010,559

SYSTEM FOR SYNCHRONIZING DATA FRAMES IN A SERIAL BIT STREAM

James T. O'Connor, Dallas, and David A. Courtright, Carrollton, both of Tex., assignors to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.

Filed Jun. 30, 1989, Ser. No. 374,277
Int. Cl.[5] H04J *3/06*
U.S. Cl. 375—116 **14 Claims**

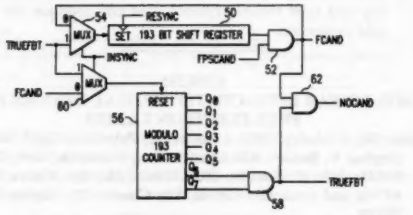
1. A system for determining frame alignment within a serial data stream, each frame having a frame bit, comprising:

a shift register having N bit locations, said register initially having all N bits set to a first logic state;

first logic means for generating a candidate signal when selected bits from the data stream match a preselected pattern;

second logic means for shifting the first logic state into said shift register if a current shift register output is in the first logic state and said first logic means is generating a candidate signal, and for shifting a second logic state into said shift register otherwise; and

a modulo N counter, wherein said counter is incremented each time said second logic means shifts the second logic



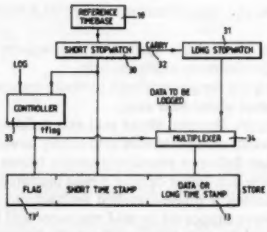
state into said shift register, and wherein said counter generates a signal identifying a frame bit position when it counts to (N−1), and wherein said counter is reset when the first logic state is shifted into said register by said second logic means.

5,010,560

DATA LOGGING APPARATUS

Mark A. Janney, Temple; Roger Newey, Scottsdale, and Irwin J. Robinson, III, Mesa, all of Ariz., assignors to Marconi Instruments, Inc., Scottsdale, Ariz.

Filed Jan. 17, 1989, Ser. No. 297,690
Int. Cl.[5] G04F *10/00*
U.S. Cl. 377—20 **5 Claims**



1. Apparatus for real-time stamping data in data logging applications, the apparatus comprising:

a) a reference time base;

b) short stopwatch means for generating from the reference time base a short-time stamp;

c) means for combining data to be logged with said short-time stamp;

d) means for storing the data and the short-time stamp;

e) a long stopwatch means connected to said short stopwatch means for generating at intervals a long-time stamp; and

f) a controller circuit for controlling the storage of the data and of the long-time and short-time stamps, the controller circuit being operative to store said long-time stamp at predetermined intervals.

5,010,561

CIRCUIT FOR MULTIPLYING THE FREQUENCY IN ONE SERIES OF INPUT PULSES

Tatsuo Itoh, Higashikurume, Japan, assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed May 22, 1989, Ser. No. 355,694
Claims priority, application Japan, May 23, 1988, 63-126899
Int. Cl.[5] H03B *5/20, 19/00*; H03K *4/06*
U.S. Cl. 377—47 **1 Claim**

1. A circuit which multiplies the frequency in a series of

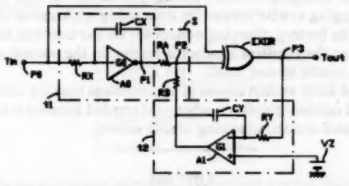
input pulses with a given frequency and a duty cycle essentially of 50% comprising:

a circuit which includes a means to generate a ramp signal in which the ramp portion is formed as a function of the repetition of the input pulse by responding to the input pulses,

an exclusive-OR logic to evaluate the exclusive-OR logic of said input pulses and the output from said ramp signal generating means.

a feedback means which couples the output of said exclusive-OR logic to the input of said exclusive-OR logic for integrating the output of said exclusive-OR logic including adding means for adding said integrated feedback signal with said ramp signal from said ramp signal generating means, said added signals coupled to the input of said exclusive-OR logic, and

a threshold voltage adjusting means coupled to said integrating and feedback means for providing a multiplied frequency having a 50% duty cycle at the output of said exclusive-OR logic by determining the direct current level of the integrating and feedback signal.



5,010,562

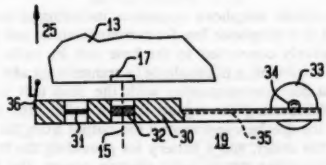
APPARATUS AND METHOD FOR INHIBITING THE GENERATION OF EXCESSIVE RADIATION

Francisco Hernandez, Concord, and Jerry Chamberlain, Pittsburg, both of Calif., assignors to Siemens Medical Laboratories, Inc., Walnut Creek, Calif.

Filed Aug. 31, 1989, Ser. No. 401,355

Int. Cl.[5] A61N *5/10*

U.S. Cl. 378—125 **19 Claims**



1. An apparatus for generating electron radiation or X-ray radiation, said apparatus comprising:

accelerator means for generating and accelerating electrons to form an electron beam which has a predetermined low intensity level for the generation of said electron radiation or a predetermined high intensity level for the generation of said X-ray radiation;

supporting means for supporting a scattering foil and a target and for selectively moving either said foil into the trajectory of said electron beam having said low intensity level for generating said electron radiation upon impingement of said electrons there or on said target into the trajectory of said electron beam having said high intensity level for generating said X-ray radiation upon impingement of said electrons thereon;

detecting means operable by said supporting means for sensing the position of said target relative to the trajectory of said electron beam; and

inhibiting means coupled to said accelerator means and to said detecting means for preventing the generation of an electron beam having said high intensity level if said foil and not said target is positioned in the trajectory of said electron beam.

5,010,563

SYSTEM FOR THE SUSPENSION OF A ROTATING ANODE OF AN X-RAY TUBE WITH PASSIVE MAGNETIC BEARINGS

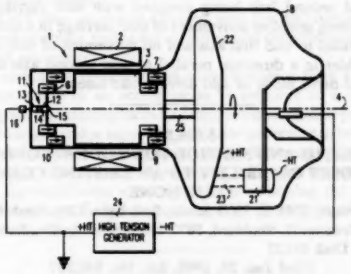
Michel Laurent, Plaisir; Marc Doukhan, Noisy Le Roi, and Pierre Noualhaguet, Issy les Moulineaux, all of France, assignors to General Electric CGR S.A., Issy les Moulineaux, France

Filed Sep. 12, 1989, Ser. No. 406,254

Claims priority, application France, Sep. 23, 1988, 88 12483

Int. Cl.[5] H01J *35/10*

U.S. Cl. 378—132 **8 Claims**



1. A system for the suspension of a rotating anode of an X-ray tube which has a rotor rotating on an axis, one end of which supports the anode and a stator placed at the outside of said tube, wherein said system comprises at least two first magnetized rings fixed to the rotor, and at least two other magnetized rings fixed a casing of said tube, said rings being positioned with respect to one another so that said rotor can rotate without mechanical friction around an axis of rotation and so that it is axially shifted so as to come into contact with a thrust-bearing placed on a side opposite that of the anode.

5,010,564

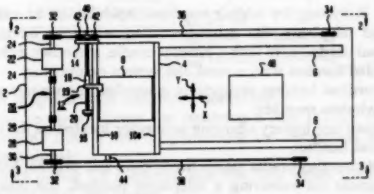
DUAL AXIS TRANSLATION MECHANISM

Howard C. Thomas, Westminster, Colo., assignor to Eureka X-Ray Tube, Inc., Chicago, Ill.

Filed Sep. 14, 1989, Ser. No. 406,991

Int. Cl.[5] G03B *42/04*

U.S. Cl. 378—176 **25 Claims**



1. A mechanism for selective translation of an object along first and second axes, comprising:

a frame;

a carriage mounted on said frame so as to allow movement of said carriage with respect to said frame along a first axis;

a holder for said object;

intermediate mounting means coupled with said holder and said carriage for mounting said holder on said carriage so

as to allow movement of said holder with respect to said carriage along a second axis which is different from said first axis;

a motor for selectively driving a first shaft;

a drive/brake assembly for providing a second shaft which, in a drive mode of said assembly is driven synchronously with said first shaft and, which in a brake mode of said assembly is held non-driven while said first shaft is being driven; and

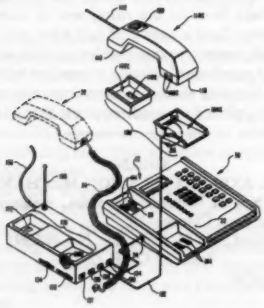
first and second endless belts mounted for rotating movement within said frame and extending in a direction parallel to said first axis, said first and second belts being coupled to said first and second shafts, respectively, for receiving selective rotational movement therefrom, with said first belt also being coupled to said intermediate mounting means for causing selective movement of said object holder in a direction parallel to said second axis during said brake mode of said drive/brake assembly and said second belt being coupled with said carriage for causing selective movement of said carriage in a direction parallel to said first axis and no movement of said object holder in a direction parallel to said second axis during said drive mode of said drive/brake assembly.

5,010,565

APPARATUS AND METHOD FOR ADDING CORDLESS HANDSET CAPABILITY TO AN EXISTING CORDED TELEPHONE

Bryan Nash, 2561 E. 3370 South, Salt Lake City, Utah 84109, and Trenton D. Stoddard, 5872 Fontaine Bleu Dr., Salt Lake City, Utah 84121

Filed Jun. 29, 1990, Ser. No. 546,567
Int. Cl.[5] H04M *11/00*
U.S. Cl. 379—61 **48 Claims**



37. A system for adding cordless capability to an existing corded telephone, the existing corded telephone having an original corded base with a handset cradle, a handset jack, and a corded handset with a cord, the system comprising:

a cordless handset comprising a wireless transmitter and a wireless receiver;

at least one battery charging connector located on the cordless handset;

first charging cradle means fitting onto said original handset cradle for receiving a telephone handset, the charging cradle means being free standing from the existing corded telephone;

first charging contact means, positioned in the first charging cradle means, for conveying a charging current to the battery charging connector on the cordless handset when the cordless handset is resting in the first charging cradle means;

first hook switch means at said corded base for actuating said corded telephone when said corded handset is carried by said first charging cradle means;

a cordless base;

a wireless transmitter located in the cordless base;

a wireless receiver located in the cordless base;

a charging circuit means located in the cordless base;

first interconnection means for electrically connecting the handset jack of the corded base to the cordless base so that information can be conveyed therebetween such that duplex communications can be established between the existing corded telephone and the cordless handset;

second charging cradle means formed at said cordless base for receiving a handset;

second charging contact means positioned in said second charging cradle means for conveying a charging current to the battery charging connector on the cordless handset when the cordless handset is resting in the second charging cradle means; and

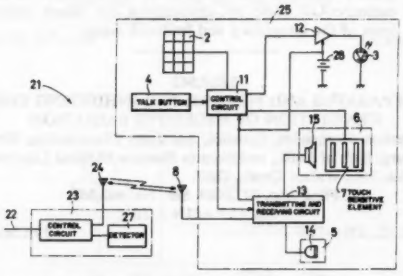
second hook switch means at said cordless base for actuating said corded telephone when said corded handset is carried by said second charging cradle means.

5,010,566

CORDLESS TELEPHONE

Masayoshi Seo, Higashi-Hiroshima, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Sep. 7, 1989, Ser. No. 403,887
Claims priority, application Japan, Sep. 8, 1988, 63-225347
Int. Cl.[5] H04M *11/00*
U.S. Cl. 379—61 **18 Claims**



1. A cordless telephone apparatus including a base unit connected to a telephone line for communication, and a handset, operatively connected to the base unit by radio waves, including a speaker, a microphone, a transmitting and receiving circuit for communicating with the base unit by radio waves, transforming the signals from a caller into acoustic sound by the speaker, and second the output from the microphone to the caller, and a battery for providing the transmitting and receiving circuit with electric power, the handset further comprising:

display means for indicating an in-service state of the cordless telephone activated for communication;

contact detecting means for detecting contact of a user with an area proximate to the speaker;

activation detecting means for detecting activation of the cordless telephone for communications to detect the in-service state; and

control means operatively connected to the display means, the contact detecting means and the activation detecting means, for controlling the display means to stop indicating an in-service state when an area proximate to the speaker is detected to be in contact with a user and an in service state is detected, in response to the contact detecting means and activation detecting means, and for controlling the display means to indicate an in-service state when an area proximate to the speaker is not detected to be in contact with a user and an in service state is detected; and

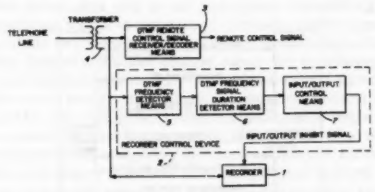
the handset battery means for electrically powering the handset.

5,010,567

RECORDER CONTROL APPARATUS FOR AUTOMATIC TELEPHONE ANSWERING SYSTEM

Masayuki Tsushima, Chofu, Japan, assignor to Tandy Electronics Japan Ltd., Tokyo, Japan

Filed Aug. 5, 1988, Ser. No. 229,126
Int. Cl.[5] H04M *1/65*
U.S. Cl. 379—77 17 Claims



14. In an automatic telephone answering system including a recorder having an input and an output connected to a telephone line for the recording and playing of messages and which is remotely controllable through the use of a dual-tone signal, a method for controlling the recorder comprising the steps of:

detecting the dual-tone signal, with a minimum time Td for such detection;

inhibiting the recorder when the dual-tone signal having dual-tone frequencies continues for a predetermined maximum allowable time, T max, which is less than said minimum time Td;

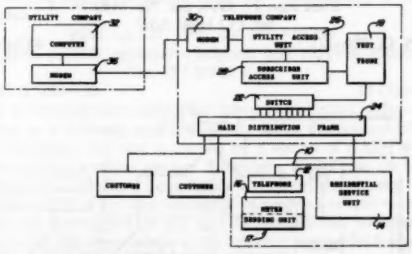
thereby preventing the signal having the dual-tone frequencies from being input to or output from the recorder over a period of time longer than the minimum time Td.

5,010,568

REMOTE METER READING METHOD AND APPARATUS

David P. Merriam; Dale L. Scott, both of Albuquerque, and Bryan F. Scott, Rio Rancho, all of N. Mex., assignors to Sparton Corporation, Jackson, Mich.

Filed Apr. 4, 1989, Ser. No. 333,117
Int. Cl.[5] H04M *11/00*
U.S. Cl. 379—107 9 Claims



1. In an automatic meter reading system of the type which utilizes a telephone system having a central office, multiple subscriber lines each having a subscriber telephone connected therewith at a subscriber station, said subscriber lines being coupled to a switch in the central office for selective connection of any one of the subscriber lines to another line, voltage supply means for supplying electrical power from the central office to the subscriber lines, a test trunk for selectively accessing said subscriber lines without ringing the telephone of the selected line, a subscriber line access means coupled with the test trunk for accessing a selected line, a transponder at the subscriber station coupled with said subscriber line and with one or more utility meters, and control signal means coupled with the subscriber access means for generating a control signal for a transponder at a selected subscriber station, the improvement wherein said transponder comprises:

detecting means for detecting a control signal on the telephone line,

a microprocessor including a read/write memory,

a meter pulse generating means coupled with said meter for producing an electrical meter pulse corresponding to a predetermined meter event,

first coupling means for coupling the meter pulse generating means to the microprocessor,

means for switching the microprocessor from a quiescent mode to an active mode in response to a meter pulse,

the microprocessor being programmed to count pulses from said meter pulse generating means and for storing the pulse count in said read/write memory, and for switching the microprocessor to the quiescent mode after the pulse count is stored,

a DTMF tone generator coupled with the microprocessor,

second coupling means for coupling said detecting means to said microprocessor,

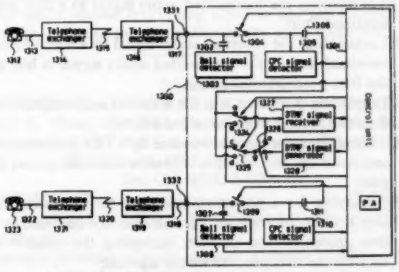
and means for switching the microprocessor from a quiescent mode to an active mode in response to a control signal, said microprocessor being programmed to produce a tone generator signal for said tone generator in response to a predetermined control signal for producing a sequence of tone pairs representing said pulse count stored in the read/write memory and for switching the microprocessor to the quiescent mode after the sequence of tone pairs is produced.

5,010,569

TELEPHONE-CALL DISTRIBUTOR

Hiromi Katagawa, Fukuoka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Aug. 2, 1989, Ser. No. 388,446
Claims priority, application Japan, Aug. 3, 1988, 63-194074; Aug. 3, 1988, 63-194075; Aug. 3, 1988, 63-194076
Int. Cl.[5] H04M *9/00*
U.S. Cl. 379—210 12 Claims



1. A telephone-call distributor comprising:

signal receiving means for receiving a first DTMF signal coming from a first telephone line and outputting a dial data signal;

control means for receiving said dial data signal from said signal receiving means;

signal generating means, responsive to said control means, for generating a second DTMF signal having a same code as said dial data signal;

forwarding means for forwarding said second DTMF signal generated by said signal generating means to a second telephone line; and

connecting means, responsive to said control means, for connecting said first telephone line with said second telephone line to thereby make a speaking circuit therebetween, said first telephone line being connected to a first

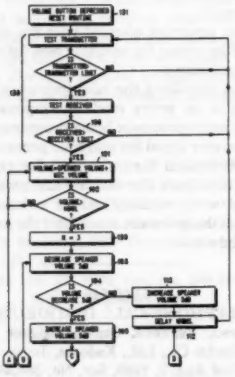
telephone set and said second telephone line being connected to a second telephone set.

5,010,570

METHOD FOR ACTIVE FEEDBACK SUPPRESSION

Daniel E. Kobylarz, Burnsville, Minn., and David K. Ford, Mesa, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 20, 1990, Ser. No. 481,531
Int. Cl.[5] H04M 9/08
U.S. Cl. 379—390 **13 Claims**



7. A method for actively suppressing feedback in a communications device having a system loop gain stored in memory, a received audio signal, a transmitted audio signal, and a user volume substantially equal to a speaker volume plus a microphone volume, the steps comprising:

(A) comparing the transmitted audio signal to a first predetermined limit;

(B) comparing the received audio signal to a second predetermined limit if the transmitted audio signal is less than the first predetermined limit;

(C) repeating from step A if the received audio signal is less than the second predetermined limit;

(D) decreasing the speaker volume by a first predetermined amount if the user volume is greater than the system loop gain;

(E) delaying for a predetermined time and repeating from step A if the microphone volume does not decrease by the first predetermined amount, increasing the speaker volume by the first predetermined amount;

(F) increasing the speaker volume by the first predetermined amount;

(G) delaying for the predetermined time and repeating from step A if the microphone volume does not increase by the first predetermined amount;

(H) repeating steps D–G a predetermined number of times;

(I) decreasing the microphone volume and the speaker volume by a second predetermined amount until the user volume is less than the system loop gain stored in memory and greater than or equal to a mid-range of the speaker volume;

(J) increasing the microphone volume and the speaker volume by the second predetermined amount until the user volume within a range bounded by the system loop gain as a lower limit and nominal volume as an upper limit; and

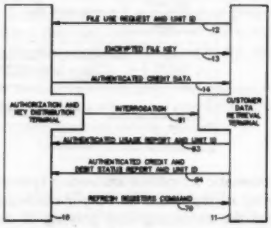
(K) repeating from step A.

5,010,571

METERING RETRIEVAL OF ENCRYPTED DATA STORED IN CUSTOMER DATA RETRIEVAL TERMINAL

Ron D. Katznelson, San Diego, Calif., assignor to Titan Linkabit Corporation and Cable/Home Communication Corporation, both of San Diego, Calif.

Filed Sep. 10, 1986, Ser. No. 905,775
Int. Cl.[5] H04L 9/00
U.S. Cl. 380—4 **43 Claims**



1. A method of controlling and accounting for retrieval of data from a memory, comprising the steps of

(a) providing a memory containing an encrypted data file from which retrieval must be authorized;

(b) authorizing said retrieval by providing an encryption key for enabling retrieval of said data and a credit signal for use in limiting the amount of data to be retrieved from said file;

(c) limiting the amount of data retrieved from said file in accordance with said credit signal;

(d) recording the amount of data retrieved from said file;

(e) reporting the recorded amount of data retrieved from said file; and

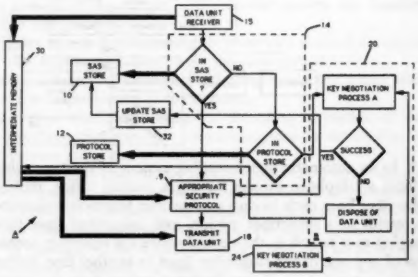
(f) authenticating said report.

5,010,572

DISTRIBUTED INFORMATION SYSTEM HAVING AUTOMATIC INVOCATION OF KEY MANAGEMENT NEGOTIATIONS PROTOCOL AND METHOD

Erwin W. Bathrick, La Habra, and James E. Zmuda, El Toro, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Apr. 27, 1990, Ser. No. 515,819
Int. Cl.[5] H04I 9/02
U.S. Cl. 380—21 **4 Claims**



1. In a distributed information system which includes a plurality of end-systems each of which includes data unit transmitting and receiving means having a security protocol and a corresponding security protocol key from one end-system to another end-system, the improvement comprising:

secure address storage means for storing a set of end-system

addresses and corresponding end-system security protocol keys;

protocol address storage means for storing a set of end-system addresses requiring security protocol data transfers;

data unit receiver means for receiving a data unit and for generating a data unit transfer request signal which includes an end-system address and data unit security protocol;

intermediate storage means for storing a received data unit in response of a data transfer request signal and outputting the stored data unit to the end-system transmitting and receiving means in response to a transfer enable signal;

automatic key management processor means responsive to the data unit transfer request signal for comparing the received data unit security key and end-system address to the set of end system address and security protocol keys, and for generating the transfer enable signal in response to a match therebetween, and in the absence of a match therebetween, comparing the received data unit address to the end-system addresses from the protocol address storage means and generating a security key protocol request signal in response to a match therebetween, and for generating the transfer enable signal in response to the absence of a match between the data unit address and an address in the set of addresses stored in the protocol address storage means;

security key negotiating means responsive to the security key protocol request signal for negotiating a security key with another end-system and for generating a security key negotiation confirm signal upon completion of a negotiation;

means responsive to the security key negotiation confirm signal for storing the security key for the another end-system in the one system secure address store storage means;

and wherein each end-system is responsive to the security key negotiation confirm signal and is adapted to generate the transfer enable signal, and wherein the end-system data unit transmitting and receiving means are responsive to the transfer enable signal and are adapted to transfer the data unit corresponding to the security protocol of the received data unit, and wherein the security key negotiation comprises a fully encrypted negotiation exchange.

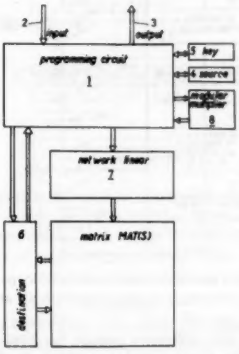
5,010,573

CRYPTOGRAPHIC SYSTEM BY BLOCS OF BINERY DATA

Emile P. Musyck, Amerikalaan 28, 2440 Geel, and Christian E. Musyck, Rue de Bonlez 26, 5980 Grez Doiceau, both of Belgium

Filed Apr. 27, 1990, Ser. No. 515,236
Claims priority, application Belgium, Apr. 28, 1989, 8900467
Int. Cl.[5] H04L *9/06*
U.S. Cl. 380—28 **13 Claims**

1. A cryptographic system for converting a vector of data of n bits to a ciphered vector of n bits under the control of a cryptographic key that is formed by a vector of n bits, too, with n being a whole number comprising means that allows, using a DLM (discrete Logarithnm Multiplier) algorithnm, for calculating from an input vector Es referred to a source vector and that corresponds to the data to be ciphered, an output vector Ed that corresponds to the ciphered text which is equal to the state of a linear shift register that corresponds to a register composed of n elements and of one negative feedback loop, at least, with the latter being formed by or-exclusive circuits, the inlets and outlets of which are linked to the outlets and inlets of the elements of the shift register so as to obtain for this shift register the maximum possible length of 2 exp(n)−1 for the sequence of the consecutive states, referred to as linear sequence, with each state of this register representing a jump, the origin of which is a reference vector referred to as "zero-origin", and with the value of the jump being the sequence number of this state in the linear sequence, with these means also being so designed that each jump may be expressed in the form of a linear relation REL as a function of the n first states of the linear sequence as from the "zero-origin" state, with the n states allowing for grouping in the form of n columns in view of achieving a square matrix referred to as MAT(O), with this matrix containing implicitly all the elements that characterize the shift register, with the aforesaid relation REL constituting an invariant for a jump that comprises an equal number of consecutive states of the linear sequence between the origin and the destination of the jump, with the origin of the jump corresponding to the first vector of a set of n consecutive states of the linear sequence grouped in columns in order to obtain a square matrix MAT(S), with the matrix product of this matrix by the vector REL giving the destination of the jump, with the



algorithm DLM allowing for searching for the aforesaid output vector while using this linear relation, the vector which corresponds to the state of the linear sequence being defined by a jump counted from the reference vector "zero-origin" equal to k times the modulo (2 exp(n)−1) jump that characterizes the source vector, with the jump corresponding to the output vector of the algorithm DLM being obtained through a succession of jumps put end to end and commencing at this reference vector, with these jumps being of two types, the first type being equal to the jump from the reference vector to the source vector and a second type being equal to the jump from the reference vector to the destination of the jump made last.

5,010,574

VECTOR QUANTIZER SEARCH ARRANGEMENT

Robert C. Wang, Mendham Township, Morris County, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jun. 13, 1989, Ser. No. 365,642
Int. Cl.[5] G10L *5/00*
U.S. Cl. 381—42 **23 Claims**

1. A method for coding a multi-element signal comprising the steps of:

storing a plurality of multi-element reference signals $y_1, y_2, \ldots, y_N$ in a codebook storage array representable in a prescribed vector space;

receiving a multi-element input signal x representable in the prescribed vector space; and

selecting one of the stored reference signals y_m to represent the multi-element input signal;

the selecting step including:

selecting a predetermined orientation of a reference line for projection mapping in the prescribed vector space,

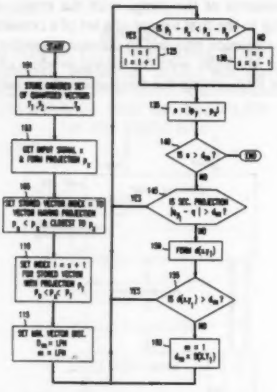
forming a set of signals each representative of the projection p_{yn} of the reference signal y_n on the reference line with the predetermined orientation in the prescribed vector space,

forming a signal representative of the projection p_x of the input signal on the reference line with the predetermined orientation in the prescribed vector space,

choosing one or more of the stored reference signals y_l

responsive to their projections p_{yi} on the reference line with the predetermined orientation,

generating for each chosen reference signal y_i, a signal representative of the difference between the reference signal projection and the input signal projection on the reference



line with the predetermined orientation $|p_{yi}-p_x|$ responsive to the reference signal projection p_x, and input signal projection p_x, and

determining the reference signal y_m that most closely matches the input signal responsive to the projection difference signals.

5,010,575

AUDIO CURRENT PICK-UP DEVICE

Yozo Marutake; Tatsuro Fukutome, and Motomu Asami, all of Tokyo, Japan, assignors to Rion Kabushiki Kaisha, Tokyo, Japan

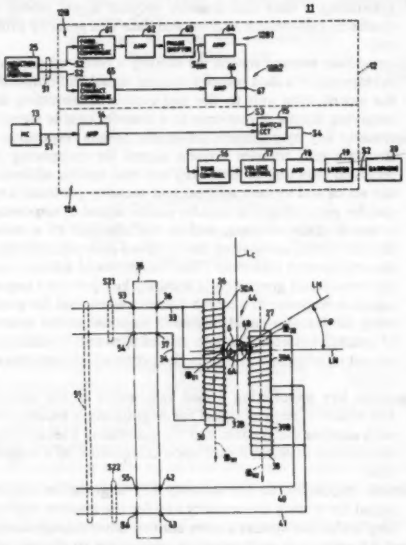
Filed May 17, 1989, Ser. No. 353,839

Claims priority, application Japan, May 30, 1988, 63-134085

Int. Cl.[5] H04R *25/00*; H04M *1/100*

U.S. Cl. 381—68 **3 Claims**

1. An audio current pick-up device comprising a first magnetic induction coil means including at least one induction coil, a second magnetic induction coil means including at least one induction coil, said first and said second magnetic induction coil means being arranged in parallel to each other with an axial positional deviation of said induction coil of said first magnetic induction coil means with respect to that of said second magnetic induction coil means by a predetermined amount, and circuit means for combining output signals of said first and said second magnetic induction coil means to form a sound output signal, wherein said first and said second magnetic induction coil means include magnetic rod cores, respectively, and wherein a pair of coils are wound in opposite directions on respective halves of each of said magnetic rod cores,



said pair of coils being connected in parallel to each other, and said output signals being derived from said coil pairs.

5,010,576

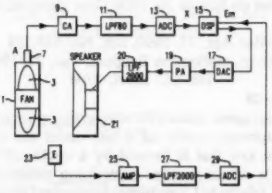
ACTIVE ACOUSTIC ATTENUATION SYSTEM FOR REDUCING TONAL NOISE IN ROTATING EQUIPMENT

Peter D. Hill, Monroeville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 22, 1990, Ser. No. 468,329

Int. Cl.[5] G10K *11/16*

U.S. Cl. 381—71 **24 Claims**



15. An active acoustic attenuation system for attenuating tonal noise associated with a fan having a plurality of blades, said system comprising:

an accelerometer mounted on said fan and generating a sinusoidal signal having a frequency representative of the rotational speed of said fan;

means clipping said sinusoidal signal to generate a clipped signal having a fundamental frequency equal to the frequency of rotation of said fan and containing harmonic frequencies of the fundamental frequency of said fan speed which include the fundamental frequency and harmonic frequencies of said blade pass tonal noise; speaker means mounted adjacent said fan and generating canceling sound for combination with and attenuation of said fundamental frequency and harmonic frequencies of the blade pass tonal noise of said fan;

an error microphone spaced from said fan and said speaker detecting said combination of tonal noise and canceling sound and generating an error signal therefrom; and

electronic controller means responsive to the clipped signal and said error signal for driving said speaker, said electronic controller means including adaptive filter means which accommodates for acoustics delays between said fan, the speaker and the error microphone.

5,010,577
ELECTRONIC VOLUME DEVICE

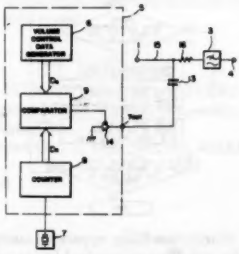
Masayuki Sakanishi, Tokyo, and Takaaki Ishii, Sagamihara, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 26, 1988, Ser. No. 262,649

Claims priority, application Japan, Oct. 29, 1987, 62-165985[U]

Int. Cl.[5] H03G *3/00*

U.S. Cl. 381—104 **11 Claims**



1. An electronic volume device comprising:

a volume control circuit constituted by a monolithic integrated circuit and having a signal output terminal, including switching control signal generating means for generating a switching control signal having a duty cycle corresponding to a desired proportion of attenuation, and means for switching the signal output terminal between a floating state and a grounded state in accordance with the switching signal generated by the switching control generating means;

a signal line through which an input analog signal is applied;

means for connecting the signal output terminal of the volume control circuit to the signal line; and

a low pass filter connected to the signal line for forming an output signal by eliminating high frequency components from the signal on the signal line.

5,010,578
METHOD AND APPARATUS FOR THE IDENTIFICATION OF METAL SURFACE FINISHES

Pierre Siener, Thionville, and Antoine Steiner, Metz, both of France, assignors to Institut de Recherches de la Siderurgie Francaise-Irsid, Puteaux, France

Filed Jul. 17, 1989, Ser. No. 380,354

Claims priority, application France, Jul. 20, 1988, 88 09833

Int. Cl.[5] G06K *9/00, 9/46, 9/52, 9/66*

U.S. Cl. 382—8 **8 Claims**

1. Method for the identification of metal surface finishes, wherein: at least a sample portion of said surface is omnidirectionally lit,

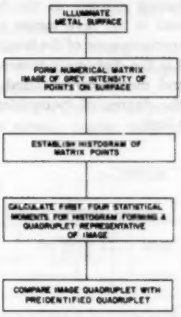
a numerical matrix image of said surface is formed, in which each matrix point is associated with a value of grey intensity as a function of the luminous intensity reflected by the corresponding element of the surface,

the set of collected values is processed in the following way:

a histogram is established, for the entire set of matrix points, of the number of points per level of grey intensity,

the first four statistical moments are calculated for said histogram, forming a quadruplet constituting four coordinates of an identification vector of the image, of order equal to or greater than four, said quadruplet being representative of the image,

said image quadruplet is compared to at least one of several pre-identified and catalogued quadruplets,


ILLUMINATE METAL SURFACE
FORM NUMERICAL MATRIX IMAGE OF GREY INTENSITY OF POINTS ON SURFACE
ESTABLISH HISTOGRAM OF MATRIX POINTS
CALCULATE FIRST FOUR STATISTICAL MOMENTS FOR HISTOGRAM FORMING A QUADRUPLET REPRESENTATIVE OF IMAGE
COMPARE IMAGE QUADRUPLET WITH PREIDENTIFIED QUADRUPLET

and if the image quadruplet is equal, allowing for predetermined tolerances for each moment, to one of said catalogued quadruplets, said image quadruplet is attributed the identity of said catalogued quadruplet.

5,010,579
HAND-WRITTEN, ON-LINE CHARACTER RECOGNITION APPARATUS AND METHOD

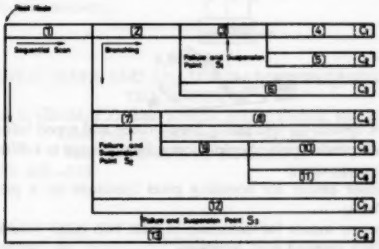
Kimiyoshi Yoshida, Kanagawa; Akio Sakano, Ibaraki; Hirofumi Tamori, Tokyo, and Masayuki Chatani, Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Aug. 24, 1989, Ser. No. 398,086

Claims priority, application Japan, Aug. 30, 1988, 63-215572

Int. Cl.[5] G06K *9/00*

U.S. Cl. 382—13 **8 Claims**



1. A hand-written, on-line character recognition apparatus comprising:

(a) means for electronically receiving hand-written stroke pattern information data;

(b) dictionary means organized in a tree and branch structure for electronically storing character data describing stroke characteristics of characters, the beginning and ending of each branch being taken as different nodes with one or more branches sharing the same nodes;

(c) evaluation scan control means for scanning the tree and branches of the dictionary means to search for character data corresponding to the hand-written stroke pattern information data, wherein the evaluation scan control means compares the hand-written stroke pattern information data with the character data stored in the successive branches of the dictionary means, continuing on to the next successive branch as long as the degree of inconsistency does not exceed a predetermined limit and returning

to the previous node to perform the same operation with respect to the character data stored in an alternative branch when the degree of inconsistency does exceed the predetermined limit; and

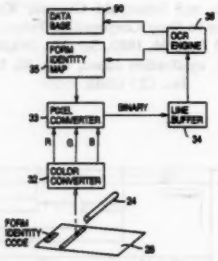
(d) save means for storing the conditions of the evaluation scan control means, wherein at least the conditions of the evaluation scanning existing at the beginning of each branch are saved in the save means upon branching in order to allow recursive use of the branches of the character data stored in the dictionary means when the evaluation scan control means has returned to the alternative branch after the degree of inconsistency exceeded the predetermined limit.

5,010,580

METHOD AND APPARATUS FOR EXTRACTING INFORMATION FROM FORMS

Kent D. Vincent, Cupertino, and Ruelming Jamp, Mountain View, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Aug. 25, 1989, Ser. No. 398,677
Int. Cl.[5] G06K 9/00
U.S. Cl. 382—17 7 Claims



1. A system for extracting handwritten and typed information of a predetermined color from a form printed in a different color, comprising:

scanner means for scanning pixel locations on a printed form;

detector means for detecting at least two color values for each scanned pixel location;

comparator means for comparing the detected color values with reference color values;

identifier means for identifying and distinguishing ones of the pixel locations on the printed form from adjacent pixel locations by comparison of their color values to the reference color values, which identifier means provides a binary output for each scanned pixel location such that one state of the binary output represents correspondence between the detected color values of the scanned pixel location and at least one of the reference color values and, thereby, indicates whether handwritten and typed information on the printed form is to be extracted from the form when the color of the printing on the form is substantially different from the color of the handwritten and typed information at adjacent locations on the printed form; and

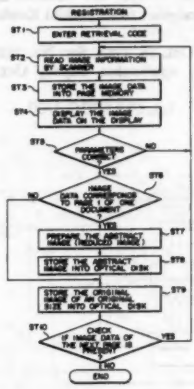
an optical character recognition engine for receiving data regarding identified ones of the pixel locations.

5,010,581

DATA PROCESSING APPARATUS HAVING FUNCTION FOR RETRIEVING ABSTRACT AND ORIGINAL IMAGE DATA

Masayuki Kanno, Fujisawa, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 30, 1988, Ser. No. 278,086
Claims priority, application Japan, Nov. 30, 1987, 62-302685
Int. Cl.[5] G06K 9/00
U.S. Cl. 382—56 24 Claims



1. An image information filing apparatus comprising:

input means for inputting an original image which includes data covering a plurality of pages;

first memory means for temporarily storing the original image input by said input means;

drafting means for drafting an abstract image, the abstract image being formed of a predetermined portion or a combination of predetermined portions of the original image;

second memory means for storing the original image as stored in said first memory means and the abstract image drafted by said drafting means in association with the original image; and

retrieve means for retrieving the abstract image, based on retrieval data corresponding to both the original image and the abstract image, from the second memory means and for retrieving the original image associated with the abstract image when the retrieved abstract image is designated by the retrieval data,

in which said second memory means stores the abstract image as a first page of the original image.

5,010,582

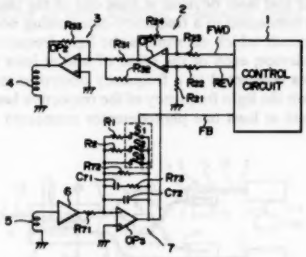
PICKUP DRIVING DEVICE FOR DISK PLAYER

Katsumi Kawamura, Tokorozawa, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Feb. 8, 1990, Ser. No. 476,948
Claims priority, application Japan, Apr. 4, 1989, 1-84974
Int. Cl.[5] H02P 5/00
U.S. Cl. 388—815 2 Claims

1. A pickup driving device for a disk player comprising: a slider for holding a pickup for a disk player, a motor for moving said slider in a radial direction of a disk, a voltage generation means for generating a driving voltage corresponding to an operation command, an amplifier circuit for amplifying said driving voltage and supplying it to said motor, a speed detection means for obtaining a speed signal corresponding to a moving speed of said slider, and a negative feedback circuit for reverse amplifying said speed signal and for superimposing the voltage to said driving voltage, wherein the gain of said negative feedback circuit is variable, and the gain of said negative

feedback circuit is made to vary correspondingly to the contents of said operation command, wherein the gain of said negative feedback circuit is made high when the content of said operation command is a first operation mode in which said



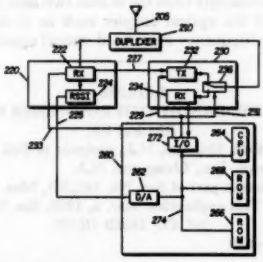
slider is moved at a low speed, and the gain of said negative feedback circuit is made low when the content of said operation command is a second operation mode in which said slider is moved at a high speed.

5,010,583

REPEATER FOR A WIDE AREA COVERAGE SYSTEM

William D. Parken, Wilton Manors, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 2, 1989, Ser. No. 415,818
Int. Cl.[5] H04B *17/00*
U.S. Cl. 455—9 **2 Claims**



1. A repeater for receiving a signal on an inbound channel and transmitting said signal on an outbound channel, comprising:

a first receiver means for receiving said signal on said inbound channel,

determination means for determining quality characteristic of said signal when received on said inbound channel,

a second receiver means for monitoring presence of a channel activity on said outbound channel,

controller means responsive to presence of said channel activity on said outbound channel and said quality characteristic of said signal for generating a control signal:

transmitter means responsive to said control signal for transmitting said signal on said outbound channel.

5,010,584

MOBILE COMMUNICATION TRANSCEIVER

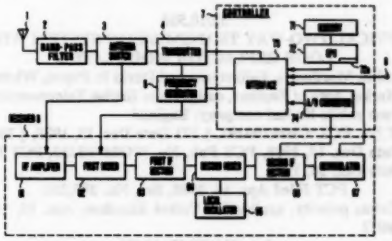
Kenji Seki, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Sep. 6, 1989, Ser. No. 403,601
Claims priority, application Japan, Sep. 14, 1988, 63-228504
Int. Cl.[5] H04B *1/44*
U.S. Cl. 455—83 **7 Claims**

1. A mobile communication transceiver including a receiver for demodulating a high-frequency signal, a transmitter for modulating a low-frequency signal into the high-frequency signal and amplifying the high-frequency signal, a frequency generator for transmitting a local frequency signal to said receiver in a reception mode and for transmitting the high-frequency signal for generating a transmission frequency signal to said transmitter in a transmission mode, a controller for transmitting data for changing a frequency of said frequency generator and for receiving transmission ON or OFF data to switch transmission and reception modes, and an antenna switch for switching between said receiver and said transmitter, wherein said controller comprises:

an A/D converter for converting an output voltage corresponding to a reception input voltage from said receiver into a digital signal;

a memory for storing a plurality of predetermined data for determining a speech enable electric field level and a



plurality of predetermined data for determining a high electric field level;

determining means for determining a speech enable electric field level by comparing the digital signal from said A/D converter with the speech enable electric field level determination data stored in said memory;

comparing means for comparing the digital signal supplied from said A/D converter through an interface with the high electric field level determination data stored in said memory when the high electric field level is determined; and

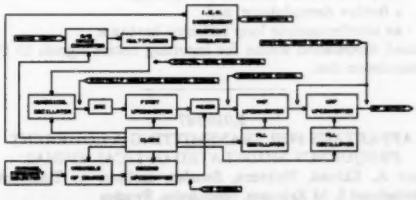
a CPU for selecting a determination level of the speech enable electric field level from the plurality of data stored in said memory.

5,010,585

DIGITAL DATA AND ANALOG RADIO FREQUENCY TRANSMITTER

Rafael A. Garcia, P.O. Box 530153, Miami Shores, Fla. 33153

Filed Jun. 1, 1990, Ser. No. 531,587
Int. Cl.[5] H04B *1/04*; H04L *27/12*
U.S. Cl. 455—118 **11 Claims**



1. An RF transmitter for transmitting either analog voice or digital data comprising:

multiplexing means for switching between an analog voice input and digital data inputs to provide a selected signal, numerical oscillator means connected to the output of the multiplexing means for converting the selected signal to a digitally modulated numeric frequency signal,

D/A conversion means connected to the output of the numerical oscillator means for converting the digitally modulated numeric frequency signal to an analog signal,

first upconversion means connected to the output of the D/A conversion means for upconverting the analog signal to a first higher frequency signal,

variable RF source means for providing a selected accurate preset frequency signal within a range of frequencies,

second upconversion means connected to the output of the variable RF source means for upconverting the preset frequency signal to a second higher frequency signal,

mixing means connected to the output of both the first and second upconversion means to provide a modulated signal,

clock means connected to the numerical oscillator means, the variable RF source means and the first and second upconversion means for providing synchronization for each said means.

5,010,586

OPTICAL TWO-WAY TRANSMISSION SYSTEM WITH LOOP REFLECTOR MODULATOR

David B. Mortimore, Felixstowe, and David B. Payne, Wickham Market, both of England, assignors to British Telecommunications public limited company, England

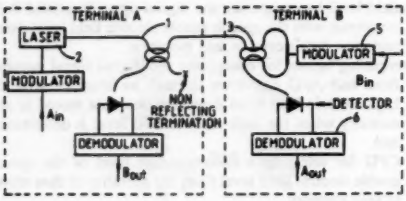
PCT No. PCT/GB88/00291, § 371 Date Dec. 13, 1988, § 102(e) Date Dec. 13, 1988, PCT Pub. No. WO88/08232, PCT Pub. Date Oct. 20, 1988

PCT Filed Apr. 14, 1988, Ser. No. 288,251

Claims priority, application United Kingdom, Apr. 15, 1987, 8709072

Int. Cl.[5] H04B *10/12*

U.S. Cl. 455—605 12 Claims



1. A two way transmission system of the type for transmitting signals over a transmission line, said system comprising:

a first terminal operatively coupled to said transmission line, said first terminal having a source and further including:

a first modulation means for inputting a signal to said transmission line, and

a first demodulator for receiving return signals from a second terminal; and

a second terminal operatively coupled to said transmission line, said second terminal comprising:

a further demodulator, and

an interferometric loop reflector having a second modulation means for inputting return signals to the transmission line.

5,010,587

APPARTAUS FOR TRANSMITTING A COHERENT FREQUENCY MODULATED OPTICAL SIGNAL

Hans A. Eklund, Nykvarn, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Mar. 8, 1989, Ser. No. 321,065

Claims priority, application Sweden, Mar. 11, 1988, 8800884

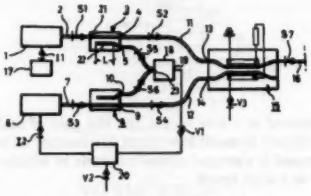
Int. Cl.[5] H04B *10/04*

U.S. Cl. 455—618 4 Claims

1. Apparatus for transmitting a coherent, frequency modulated optical signal, said apparatus comprising:

a laser light source transmitting at least two frequencies, each frequency having a spectral bandwidth which is less than 100 MHz,

an optical coupler connected to the laser light source and controllable by an electrical control means wherein the laser light source includes at least two laser devices each with an optical output connected to an optical input of the optical coupler and also to at least one photodetector, each photodetector connected to said optical outputs of two of said laser devices; at least one of the laser devices being connected to a frequency-determining normal control circuit which determines the light frequency of this laser device; each of the other of said at least two laser devices connected to a frequency control circuit which controls the light frequency of the respective laser device, and said at least one photodetector connected to one of



the frequency controlling circuits, said at least one photodetector transmits difference signals corresponding to the difference between frequencies of the laser devices, to the frequency controlling circuits which transmit control signals corresponding to said difference signals and at least one outside reference signal to the other of said at least two laser devices, so that the frequency differences of the laser devices are determined by said at least one outside reference signal; the electrical control means coupling the light alternatingly from the at least two laser devices to an output of the optical coupler such as to constitute the coherent, frequency modulated optical signal.

5,010,588

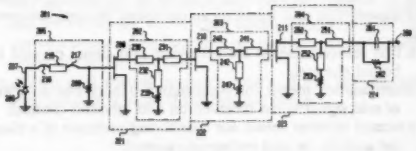
ULTRAWIDE-BANDWIDTH LOW-NOISE OPTICAL RECEIVER

James L. Gimlett, Holmdel, N.J., assignor to Bell Communications Research, Inc., Livingston, N.J.

Continuation-in-part of Ser. No. 166,267, Mar. 10, 1988, abandoned. This application Mar. 6, 1989, Ser. No. 318,844

Int. Cl.[5] H04B *10/06*

U.S. Cl. 455—619 16 Claims



1. An optical receiver having a bandwidth that extends from near dc to the multi-gigahertz range for converting a received optical signal to an amplified electrical signal at the output of the receiver, said receiver comprising:

photodetector means for converting the received optical signal to a proportional low-level electrical signal,

inductive/resistive frequency enhancement means connected to said photodetector means for extending the high frequency response of a first stage of an amplifying means and for providing a high input impedance to said first stage,

said amplifying means being connected between said frequency enhancement means and said receiver output and comprising a plurality of amplifying stages each comprising a transistor amplifier and a microwave matching circuit comprising a modified T-network having as series-arm impedances inductive elements and as a shunt-leg

impedance a microwave element in series with a resistor, said amplifying stages providing individual input and output impedances decreasing successively from said high input impedance at said first of said stages to a low output impedance at the last of said stages, the resistor in the shunt-leg of each modified T-network being chosen to extend the bandwidth of each stage to near the dc level and the values of said inductive and microwave elements being chosen to preserve the high frequency response as extended by said frequency enhancement means.

DESIGN PATENTS

GRANTED APR. 23, 1991

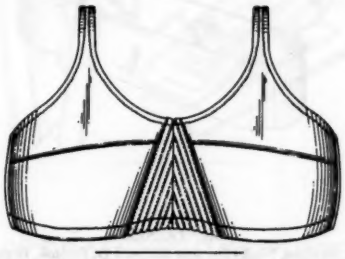
ERRATA

For CLASS	See PATENT NO.
D25-122	316,444
D26-068	316,452

DESIGNS

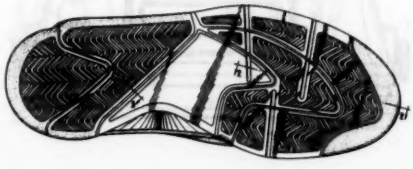
APRIL 23, 1991

316,322
SPORTS BRASSIERE
Paula K. Bosler; Robert H. Bosler, both of Reno, Nev., and Melvin A. Pomeranz, Los Angeles, Calif., assignors to Firm Action Sports Apparel, Reno, Nev.
Filed Mar. 30, 1987, Ser. No. 31,531
Term of patent 14 years
U.S. Cl. D2—24

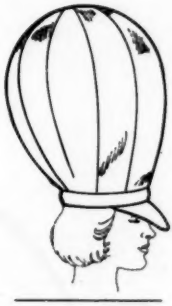


316,323
QUARTER PANEL SET FOR SHOE UPPER
Tinker Hatfield, Portland, Oreg., assignor to Nike, Inc. and Nike International Ltd., both of Beaverton, Oreg.
Filed Jun. 15, 1990, Ser. No. 538,494
Term of patent 14 years
U.S. Cl. D2—314

316,324
CUP SHAPED SHOE SOLE
Bruce E. Rogers, Portland, Oreg., assignor to Nike, Inc. and Nike International Ltd., both of Beaverton, Oreg.
Filed Jun. 15, 1990, Ser. No. 539,521
Term of patent 14 years
U.S. Cl. D2—320



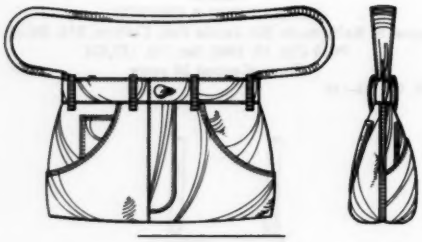
316,325
INFLATABLE HAT
Estelle M. Redden, P.O. Box 104-Easy St., Cedar Key, Fla. 32625
Filed Jun. 8, 1987, Ser. No. 22,422
Term of patent 14 years
U.S. Cl. D2—509



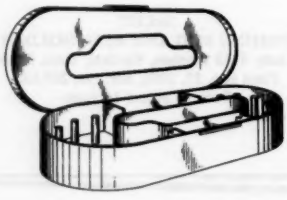
316,326
POCKET FOR A CRUTCH
Eugene S. Kaldenbach, 301 Jennie Run, LaPlata, Md. 20646
Filed Feb. 19, 1988, Ser. No. 157,524
Term of patent 14 years
U.S. Cl. D3—10

316,327
FISHING ROD AND REEL HOLDER
Homer L. Craft, 6143 Ivanhoe, Bartlett, Tenn. 38134
Filed Sep. 27, 1988, Ser. No. 250,125
Term of patent 14 years
U.S. Cl. D3—38

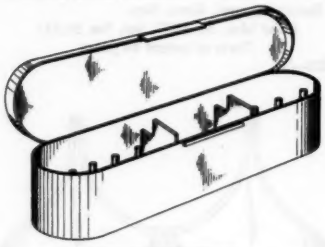
316,328
WOMAN'S SHOULDER BAG
Kathy Willoughby, P.O. Box 417, Wayne, Okla. 73095
Filed Sep. 2, 1988, Ser. No. 240,104
Term of patent 14 years
U.S. Cl. D3—44



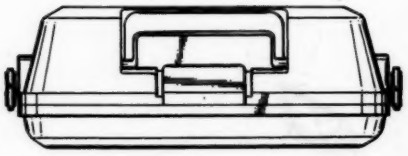
316,329
SOCKET ORGANIZER WITH A HANDLE
Peter Vicento, 3445 Cleveland St. N.E., Minneapolis, Minn. 55418
Filed May 17, 1988, Ser. No. 194,736
Term of patent 14 years
U.S. Cl. D3—74



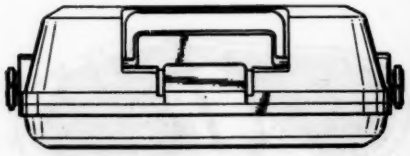
316,330
SOCKET ORGANIZER
Peter Vicento, 3445 Cleveland St. NE., Minneapolis, Minn. 55418
Filed May 17, 1988, Ser. No. 194,737
Term of patent 14 years
U.S. Cl. D3—74



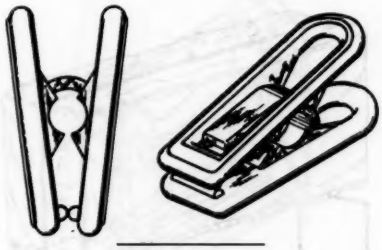
316,331
CONTAINER
John A. Bridges, Nashville, and Richard D. Booten, Brentwood, both of Tenn., assignors to Aladdin Industries, Nashville, Tenn.
Filed Oct. 21, 1988, Ser. No. 260,664
The portion of the term of this patent subsequent to Apr. 23, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D3—74



316,332
CONTAINER
John A. Bridges, Nashville, and Richard D. Booten, Brentwood, both of Tenn., assignors to Aladdin Industries Inc., Nashville, Tenn.
Filed Oct. 21, 1988, Ser. No. 260,666
The portion of the term of this patent subsequent to Apr. 23, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D3—74

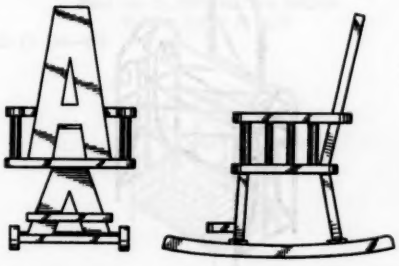


316,333
CLIP FOR A CLOTHES HANGER
Isao Maki, Tokyo, Japan, assignor to Soko Co., Ltd., Tokyo, Japan
Filed Apr. 4, 1989, Ser. No. 333,594
Claims priority, application Japan, Oct. 7, 1988, 63-39213
Term of patent 14 years
U.S. Cl. D6—328



316,334
CLAMP FOR A GARMENT CLAMPING HANGER
Everett L. Duester, Zeeland, Mich., assignor to Batts, Inc., Zeeland, Mich.
Filed Oct. 30, 1989, Ser. No. 429,181
Term of patent 14 years
U.S. Cl. D6—328

316,335
CHAIR
Michael Karas, 211 W. Main St., Waunakee, Wis. 53597
Filed Sep. 8, 1987, Ser. No. 94,433
Term of patent 14 years
U.S. Cl. D6—345

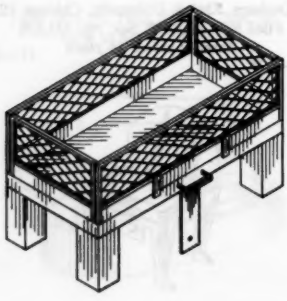


316,336
CHAISE
Richard Frinier, Long Beach, Calif., assignor to Brown Jordan Company, El Monte, Calif.
Filed Jul. 19, 1988, Ser. No. 221,190
Term of patent 14 years
U.S. Cl. D6—361

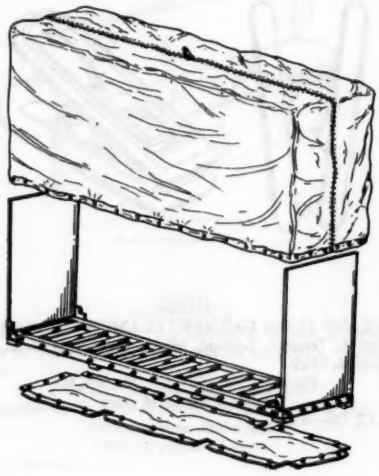
316,337
CHAIR
Bradley R. Orsburn, 5345 S. University, Chicago, Ill. 60615
Filed Feb. 10, 1988, Ser. No. 154,628
Term of patent 14 years
U.S. Cl. D6—374

316,338
CHAIR
Richard Frinier, Long Beach, Calif., assignor to Brown Jordan Company, El Monte, Calif.
Filed Jan. 11, 1988, Ser. No. 142,748
Term of patent 14 years
U.S. Cl. D6—380

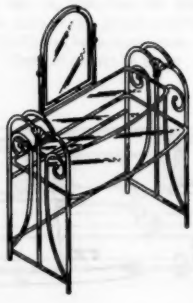
316,339
PORTABLE COLLAPSIBLE CRIB
Gwen S. Taylor, 325 N. Patterson St., Prince George B.C., Canada V2M 3J3
Filed Aug. 21, 1987, Ser. No. 87,905
Term of patent 14 years
U.S. Cl. D6—391



316,340
COMBINED LOG HOLDER AND COVER
Larry Richardson, 3235 Valley View St., Powder Springs, Ga. 30073
Filed Jul. 20, 1987, Ser. No. 75,312
Term of patent 14 years
U.S. Cl. D6—397

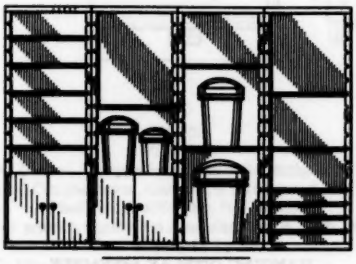


316,341
VANITY TABLE
Peter M. Y. Kee, Happy Valley, Hong Kong, assignor to Rosalco, Inc., Louisville, Ky.
Filed Jul. 31, 1990, Ser. No. 560,311
Term of patent 14 years
U.S. Cl. D6—397



316,342
TOWEL RACK
Peter M. Y. Kee, Happy Valley, Hong Kong, assignor to Rosalco, Inc., Louisville, Ky.
Filed Jul. 31, 1990, Ser. No. 560,318
Term of patent 14 years
U.S. Cl. D6—410

316,343
CHILDREN'S TOY ORGANIZER
Michael J. Coon, 20 Woodside Ave., Oneonta, N.Y. 13820
Filed Nov. 3, 1988, Ser. No. 266,144
Term of patent 14 years
U.S. Cl. D6—436

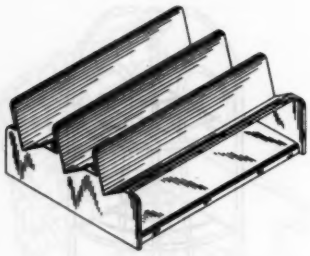


316,344
MAGAZINE RACK
Peter M. Y. Kee, Happy Valley, Hong Kong, assignor to Rosalco, Inc., Louisville, Ky.
Filed Jul. 31, 1990, Ser. No. 560,316
Term of patent 14 years
U.S. Cl. D6—462

316,345
CORNER SHELF
Peter Mo Yau Kee, Happy Valley, Hong Kong, assignor to Rosalco, Inc., Louisville, Ky.
Filed Jul. 31, 1990, Ser. No. 560,315
Term of patent 14 years
U.S. Cl. D6—465

316,346
DISPLAY CASE FOR JEWELRY ITEMS
Mallory B. Jackson, and Joseph S. Jackson, Jr., both of 11840 N. 54th St., Scottsdale, Ariz. 85254
Filed Apr. 15, 1988, Ser. No. 182,308
Term of patent 14 years
U.S. Cl. D6—464

316,347
SUPPORT STAND FOR HANDHELD REMOTE CONTROLLERS
Eugene Getto, New York, N.Y., assignor to Itemakers Ltd., Forest Hills, N.Y.
Filed Jun. 15, 1988, Ser. No. 207,304
Term of patent 14 years
U.S. Cl. D6—467

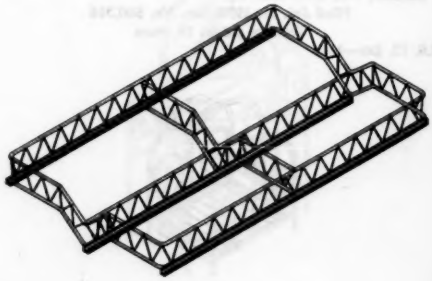


316,348
TABLE
Vittorio Livi, Pesaro, Italy, assignor to FIAM S.r.l., Tavullia, Italy
Filed Feb. 1, 1985, Ser. No. 697,387
Claims priority, application Italy, Aug. 6, 1984, 22808 B/84
Term of patent 14 years
U.S. Cl. D6—484

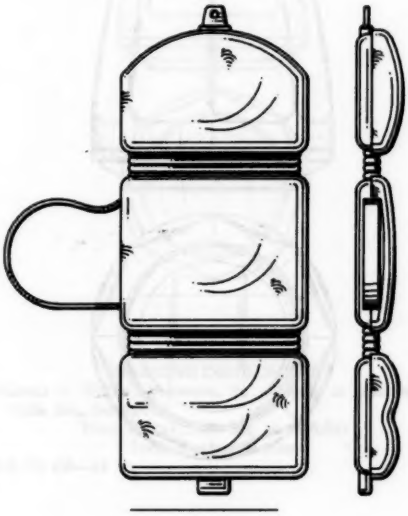
316,349
TABLE
Peter M. Y. Kee, Happy Valley, Hong Kong, assignor to Rosalco, Inc., Louisville, Ky.
Filed Jul. 31, 1990, Ser. No. 560,320
Term of patent 14 years
U.S. Cl. D6—487

316,350
SUPPORT PEDESTAL FOR A TABLE
Steven A. Beaudry, 12261 Drake St., Coon Rapids, Minn. 55433
Filed Aug. 4, 1987, Ser. No. 81,436
Term of patent 14 years
U.S. Cl. D6—495

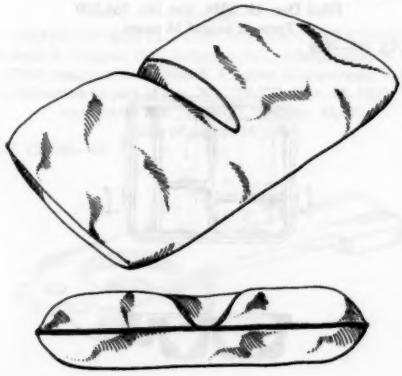
316,351
HANGING DISPLAY ASSEMBLY
Richard J. Rubin, Newton, Mass., assignor to Boston Metal Products Corp., Medford, Mass.
Filed Jan. 23, 1989, Ser. No. 301,251
Term of patent 14 years
U.S. Cl. D6—513



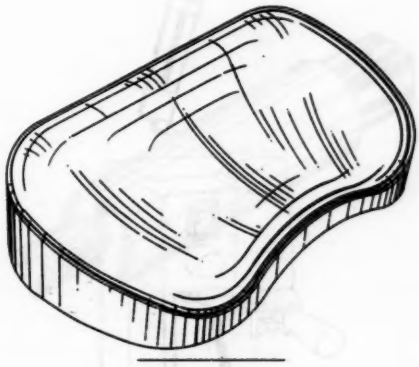
316,352
COMBINATION BABY COOLING PAD AND COVER THEREFOR
Karen K. Anson, 7411 W. Division Rd., Andrews, Ind. 46702
Filed May 26, 1989, Ser. No. 357,108
Term of patent 14 years
U.S. Cl. D6—596



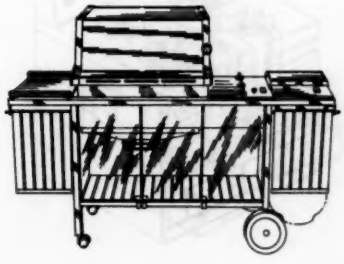
316,353
PILLOW
John R. Dobson, Campbelltown, Australia, assignor to Susan Dobson, Campbelltown, Australia, a part interest
Filed Feb. 3, 1989, Ser. No. 306,645
Claims priority, application Australia, Aug. 5, 1988, 2645
Term of patent 14 years
U.S. Cl. D6—601



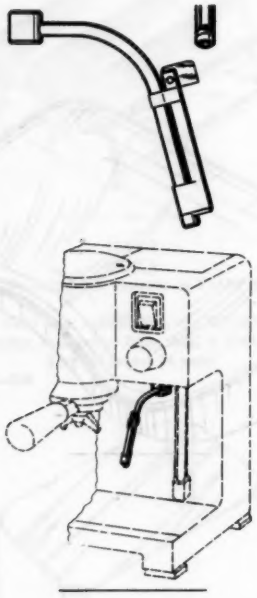
316,354
LOIN REST
Robert Bool, 62 Victoria Street, Balmoral Heights, Queensland 4171, Australia
Filed Feb. 21, 1989, Ser. No. 313,257
Claims priority, application Benelux, Aug. 19, 1988, 63548-00
Term of patent 14 years
U.S. Cl. D6—601



316,355
PORTABLE GAS GRILL
James C. Stephen, Arlington Heights; Erich J. Schlosser, Barrington, and Donald D. Pestka, Arlington Heights, all of Ill., assignors to Weber-Stephen Products Co., Palatine, Ill.
Filed Aug. 12, 1988, Ser. No. 231,843
Term of patent 14 years
U.S. Cl. D7—339

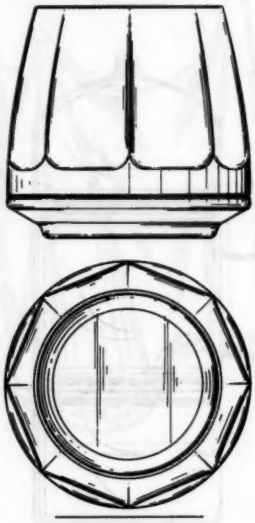


316,356
CAPPUCCINO MAKING ADAPTER FOR AN ESPRESSO MACHINE
Michael Borgmann, Solingen, Fed. Rep. of Germany, assignor to Robert Krups Stiftung & Co. KG., Solingen, Fed. Rep. of Germany
Filed Jun. 9, 1988, Ser. No. 205,114
Claims priority, application Fed. Rep. of Germany, Dec. 11, 1987, 5MR9831
Term of patent 14 years
U.S. Cl. D7—398



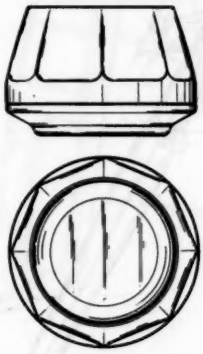
316,357
COOKING RANGE DRAWER PANEL
William D. Chanda, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.
Filed Jun. 17, 1988, Ser. No. 208,018
Term of patent 14 years
U.S. Cl. D7—405

316,358
INSULATED DRINKING TUMBLER
Christopher S. Thorp, Mystic, Conn., assignor to Dinex International, Inc., Norwich, Conn.
Filed May 2, 1988, Ser. No. 189,520
The portion of the term of this patent subsequent to Apr. 23, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D7—531

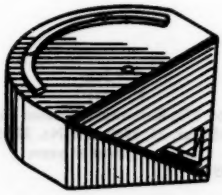


316,359
FOOD SERVING TRAY
John W. Anderson, Springfield, Mass., assignor to Temp-Tech Co. Inc., Springfield, Mass.
Filed Dec. 19, 1988, Ser. No. 286,059
Term of patent 14 years
U.S. Cl. D7—549

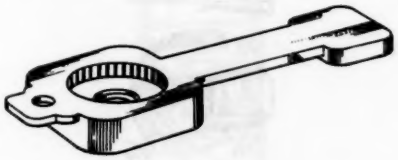
316,360
INSULATED BOWL
Christopher S. Thorp, Mystic, Conn., assignor to Dinex International, Inc., Norwich, Conn.
Filed May 2, 1988, Ser. No. 189,700
The portion of the term of this patent subsequent to Apr. 23, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D7—565



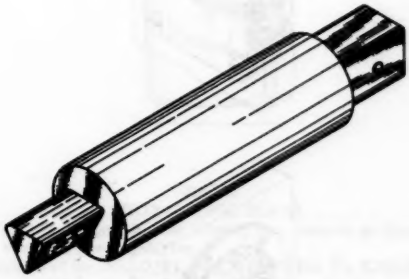
316,361
MARKING INSTRUMENT
Michael D. Kieffer, Avonmore, Pa., assignor to Mannington Mills, Inc., Salem, N.J.
Filed Apr. 11, 1988, Ser. No. 180,032
Term of patent 14 years
U.S. Cl. D8—14



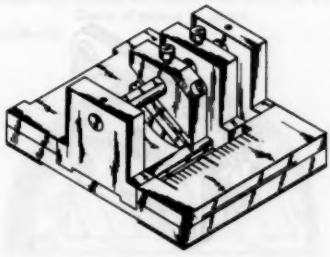
316,362
COMBINED BOTTLE CAP AND CAN TAB OPENER
Michael E. Hughes, 7112 Jefferson, NE., Albuquerque, N. Mex. 87109, assignor to Michael E. Hughes, Albuquerque, N. Mex.
Continuation-in-part of Ser. No. 798,577, Nov. 15, 1985. This application Mar. 30, 1987, Ser. No. 33,481
Term of patent 14 years
U.S. Cl. D8—40



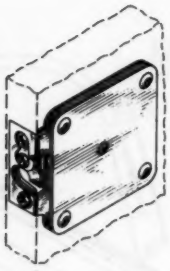
316,363
SOCKET ADAPTER FOR A DRILL
Rayford Lisenbee, P.O. Box 222, Winona, Miss. 38967
Filed Nov. 4, 1987, Ser. No. 116,677
Term of patent 14 years
U.S. Cl. D8—70

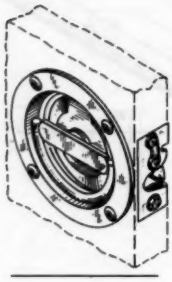


316,364
APPARATUS FOR SLITTING ELONGATED FLEXIBLE TAPE
Wiliam C. Isaacson, North Hollywood, and Herbert A. Farmery, Anaheim, both of Calif., assignors to Keen Corporation, New York, N.Y.
Filed May 20, 1987, Ser. No. 52,563
Term of patent 14 years
U.S. Cl. D8—98

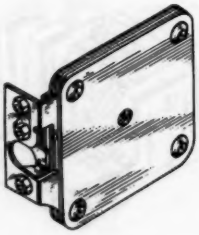


316,365
ROTARY LOCK
Randall C. Hansen, Lake Forest, Ill., and Gilbert H. Krahn, Kenosha, Wis., assignors to A.L. Hansen Manufacturing Company, Waukegan, Ill.
Filed Jan. 13, 1989, Ser. No. 297,064
Term of patent 14 years
U.S. Cl. D8—331





316,366
ROTARY LOCK
Randall C. Hansen, Lake Forest, Ill., and Gilbert H. Krahn, Kenosha, Wis., assignors to A. L. Hansen Manufacturing Company, Waukegan, Ill.
Filed Jan. 13, 1989, Ser. No. 297,534
Term of patent 14 years
U.S. Cl. D8—331



316,367
GROUND STAKE FOR RETAINING IRRIGATION CONDUIT
Donald O. Olson, 1935 Altozana Dr., El Cajon, Calif. 92020
Filed Dec. 27, 1988, Ser. No. 290,096
Term of patent 14 years
U.S. Cl. D8—356

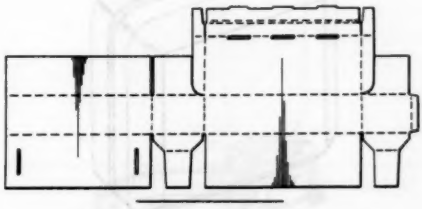
316,368
CLAMP
Daniel Kirby, Box 773, Kahnawake, Quebec J0L 1B0, Canada
Filed Mar. 23, 1989, Ser. No. 327,578
Term of patent 14 years
U.S. Cl. D8—395

316,369
COMBINED BOTTLE AND MEASURING CUP COVER
Joseph Thompson, Upper Saddle River, N.J., assignor to Sterling Drug Inc., Rensselaer, N.Y.
Filed May 31, 1988, Ser. No. 200,369
Term of patent 14 years
U.S. Cl. D9—337

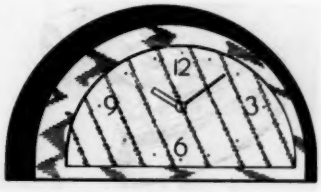
316,370
COSMETIC CONTAINER
David Hoenig, East Brunswick, N.J., assignor to Revlon, Inc., New York, N.Y.
Filed Oct. 7, 1988, Ser. No. 255,171
Term of patent 14 years
U.S. Cl. D9—337

316,371
CONTAINER
Jean-Jacques Vola, Verrieres-le-Buisson, France, assignor to Honeywell, Inc., Minneapolis, Minn.
Filed Sep. 8, 1988, Ser. No. 242,276
Term of patent 14 years
U.S. Cl. D9—353

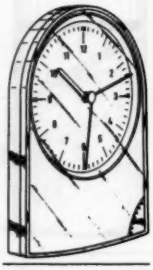
316,372
STORAGE BOX BLANK
Wedon G. Boggus, Jr., San Angelo, Tex., assignor to Stor-A-File, Inc., San Angelo, Tex.
Division of Ser. No. 67,911, Jun. 29, 1987, Pat. No. 8,312,402.
This application Sep. 4, 1990, Ser. No. 576,900
Term of patent 14 years
U.S. Cl. D9—433



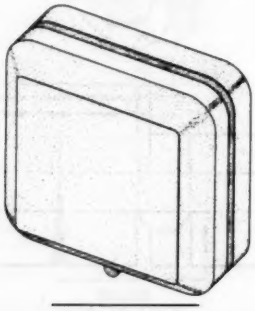
316,373
CLOCK
Seiji Odaka, Tokyo, Japan, assignor to Seikosha Co., Ltd., Japan
Filed Dec. 21, 1987, Ser. No. 135,629
Claims priority, application Japan, Jun. 22, 1987, 62-25327
Term of patent 14 years
U.S. Cl. D10—28



316,374
CLOCK
Hartmut Esslinger, and Wolfgang Joensson, both of Altensteig, Fed. Rep. of Germany, assignors to Junghans Uhren GmbH, Schramberg, Fed. Rep. of Germany
Filed Jan. 4, 1988, Ser. No. 140,411
Claims priority, application Fed. Rep. of Germany, Jul. 1, 1987, MR 1321 0B
Term of patent 14 years
U.S. Cl. D10—28



316,375
THERMOSTAT
Robert J. Tiedemann, Stamford, Conn., assignor to ITT Corporation, New York, N.Y.
Filed Jun. 27, 1989, Ser. No. 372,783
Term of patent 14 years
U.S. Cl. D10—50

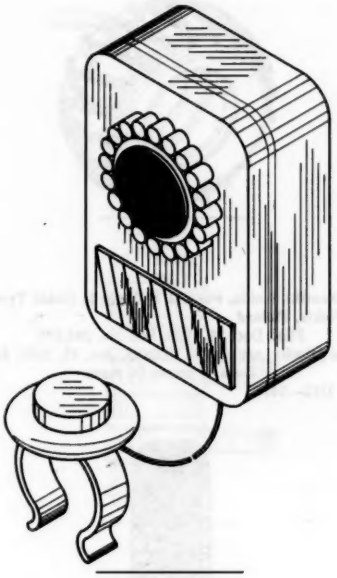


316,376
ULTRASONIC PROBE
Patrick G. Dubut, St. Paul de Vence, France, assignor to CGR Ultrasonic, Villenoy-les-Meaux, France
Filed May 22, 1987, Ser. No. 53,420
Claims priority, application France, Nov. 25, 1986, 86 6228
Term of patent 14 years
U.S. Cl. D10—60

316,377
WATTMETER
Dan B. Merlin, 4012 Tybo Ave., Las Vegas, Nev. 89110
Filed Nov. 14, 1988, Ser. No. 270,281
Term of patent 14 years
U.S. Cl. D10—78

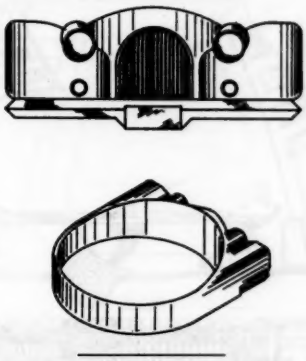
316,378
AUTOMOBILE ANTI-THEFT ALARM
John Liantonio, 3 Wichard Dr., Oakdale, N.Y. 11769
Filed Dec. 6, 1988, Ser. No. 280,525
Term of patent 14 years
U.S. Cl. D10—106

316,379
ALARM FOR A BICYCLE
Darren S. Labas, 142 - 8 St. NW., Medicine Hat, Alberta, Canada T1A 6P3
Filed Jul. 7, 1988, Ser. No. 216,249
Term of patent 14 years
U.S. Cl. D10—116



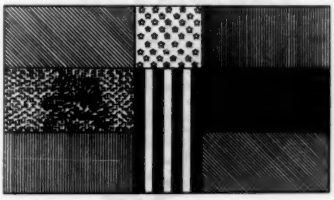
316,380
WATCH DIAL
Ryoichi Kaneko, Tokyo, Japan, assignor to Seikosha Co., Ltd., Japan
Filed Jun. 1, 1988, Ser. No. 201,094
Claims priority, application Japan, Dec. 7, 1987, 62-50034
Term of patent 14 years
U.S. Cl. D10—126

316,381
FINGER RING
Brian A. Klym, 22 Kinkora Drive, Winnipeg, Manitoba, Canada R3R 2L6
Filed Feb. 29, 1988, Ser. No. 161,675
Term of patent 14 years
U.S. Cl. D11—30

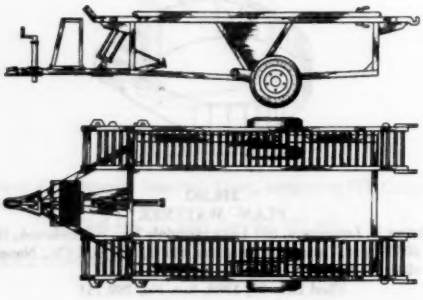


316,382
PLANT WATERER
Moises B. Lorenzana, 601 Lake Hinsdale Dr., Willowbrook, Ill. 60559, and Vance A. Lorenzana, 698 Spring Hill Cir., Naperville, Ill. 60540
Filed Dec. 27, 1988, Ser. No. 289,751
Term of patent 14 years
U.S. Cl. D11—164

316,383
FLAG
Vincent Paramore, 2207 Johnson St., Hollywood, Fla. 33020
Filed May 31, 1990, Ser. No. 531,794
Term of patent 14 years
U.S. Cl. D11—167

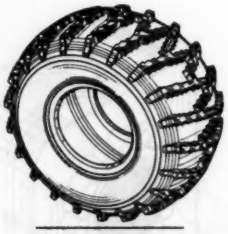


316,384
VEHICLE SERVICE TRAILER, OR SIMILAR ARTICLE
Raymond E. Teagarden, 9430 Mission Blvd., Riverside, Calif. 92509
Filed Nov. 28, 1988, Ser. No. 276,554
Term of patent 14 years
U.S. Cl. D12—94



316,385
VEHICLE TIRE
Peter R. Marriott, Hurley, Nr. Atherstone, England, assignor to SP Tyres UK Ltd., Birmingham, England
Filed May 5, 1988, Ser. No. 190,520
Claims priority, application United Kingdom, Nov. 6, 1987, 1046105
Term of patent 14 years
U.S. Cl. D12—146

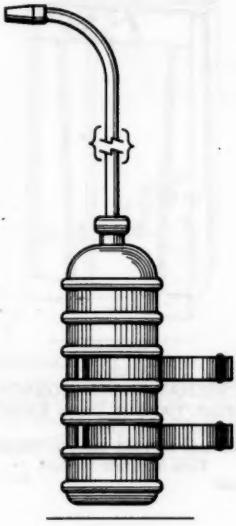
316,386
AUTOMOBILE TIRE
Tetsushi Fujiki, Hyogo, Japan, assignor to Sumitomo Rubber Industries, Ltd., Hyogo, Japan
Filed May 25, 1989, Ser. No. 357,215
Claims priority, application Japan, Dec. 26, 1988, 63-51066
Term of patent 14 years
U.S. Cl. D12—146



316,387
TIRE
Pentti Eromäki, Nokia, Finland, assignor to Nokia Tyres Limited, Nokia, Finland
Filed Dec. 14, 1988, Ser. No. 284,474
Claims priority, application Finland, Jun. 15, 1988, 541/88
Term of patent 14 years
U.S. Cl. D12—147

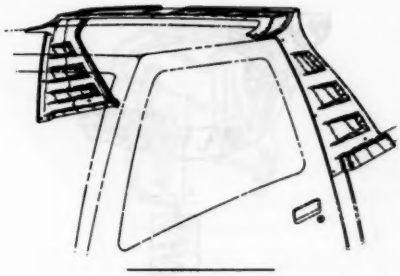
316,388
TIRE
Bill J. Wallet, Marshallville, and Joseph F. Molnar, Wadsworth, both of Ohio, assignors to Bridgestone/Firestone, Inc., Akron, Ohio
Filed Jun. 23, 1989, Ser. No. 370,510
Term of patent 14 years
U.S. Cl. D12—147

316,389
BOTTLE FOR ATTACHMENT TO A BICYCLE
Daniel H. Wood, 2108 Marchita Way, Carmichael, Calif. 95608, and Thomas S. W. Lee, 8462 Rick Mary Ct., Fair Oakes, Calif. 95628
Filed Sep. 2, 1988, Ser. No. 240,105
Term of patent 14 years
U.S. Cl. D12—158

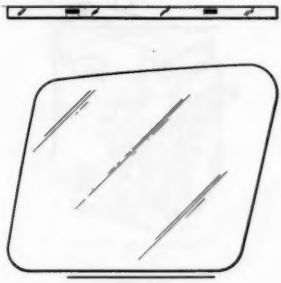


316,390
AIR DAM FOR AN AUTOMOBILE
Kazuhiro Ichinose, Tokyo, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Aug. 8, 1989, Ser. No. 391,374
Claims priority, application Japan, Feb. 8, 1989, 1-4411
Term of patent 14 years
U.S. Cl. D12—181

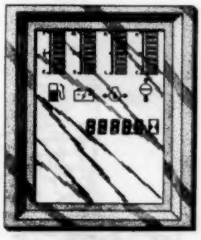
316,391
CAB FAIRING FOR TRUCKS
David M. Lund, Coon Rapids, Minn., assignor to Lund Industries, Incorporated, Minneapolis, Minn.
Filed Sep. 25, 1989, Ser. No. 410,048
Term of patent 14 years
U.S. Cl. D12—181



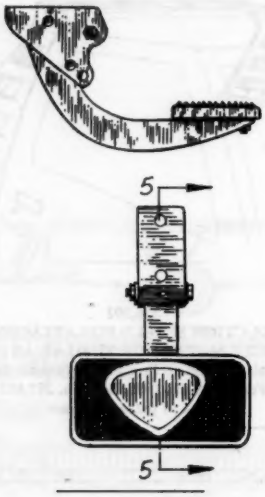
316,392
GLARE REDUCTION SHIELD FOR ATTACHMENT TO A VEHICLE MIRROR OR SIMILAR ARTICLE
Charles C. Rebeck, R.R. 3, Box 28A, Winamac, Ind. 46996
Filed Aug. 15, 1988, Ser. No. 232,653
Term of patent 14 years
U.S. Cl. D12—187



316,393
VEHICLE MONITORING DISPLAY PANEL
Wally L. Kaczmarski, Lisbon, N. Dak., assignor to Clark Equipment Company, South Bend, Ind.
Filed Jul. 25, 1988, Ser. No. 224,472
Term of patent 14 years
U.S. Cl. D12—192

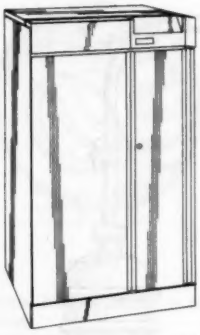


316,394
COMBINED VEHICLE STEP AND MOUNTING BRACKET
Jeff A. Carr, 10433 Samoline Ave., Downey, Calif. 90241
Filed Oct. 30, 1989, Ser. No. 428,749
Term of patent 14 years
U.S. Cl. D12—203

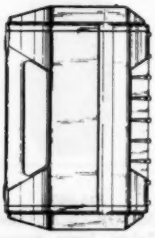


316,395
SAILING CRAFT
Toshiharu Yamada, Cypress, Calif., and Kunihiko Kobayashi, Iwata, Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan
Filed Feb. 24, 1989, Ser. No. 315,034
Term of patent 14 years
U.S. Cl. D12—304

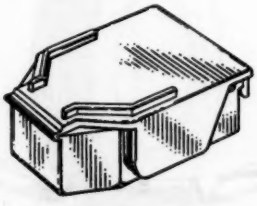
316,396
UNINTERRUPTIBLE POWER SUPPLY CELL
Jean Decosse, Charavines, and Georges Herman, Grenoble, both of France, assignors to Merlin Gerin, Meylan, France
Filed Aug. 13, 1987, Ser. No. 84,755
Claims priority, application France, Feb. 13, 1987, 505
Term of patent 14 years
U.S. Cl. D13—101



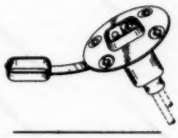
316,397
PORTABLE, RECHARGEABLE STORAGE BATTERY
Raymond F. Herbert, Yorkshire, United Kingdom, assignor to Powerbank Limited, United Kingdom
Filed Aug. 16, 1988, Ser. No. 232,895
Term of patent 14 years
U.S. Cl. D13—106



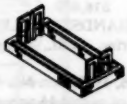
316,398
HOUSING FOR A BATTERY TERMINAL CONNECTOR
Jeremy C. Hill, 603½ Orchid Ave., Corona del Mar, Calif. 92628, assignor to Ronald G. Slagle, Laguna Beach and Jeremy C. Hill, Corona del Mar, both of, Calif.
Filed Sep. 19, 1988, Ser. No. 246,380
Term of patent 14 years
U.S. Cl. D13—120



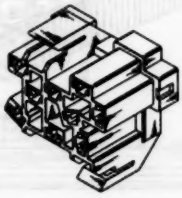
316,399
PANEL ELECTRICAL CONNECTOR
Richard F. Wharton, Glenview, Ill., assignor to Safco Corporation, Chicago, Ill.
Filed Oct. 28, 1988, Ser. No. 264,188
Term of patent 14 years
U.S. Cl. D13—133



316,400
OUTER HOUSING OF ELECTRICAL CONNECTOR
Yasuharu Moriai, and Osamu Ito, both of Suzuka, Japan, assignors to Sumitomo Wiring Systems, Ltd., Yokkaichi, Japan
Filed Nov. 14, 1988, Ser. No. 271,082
Claims priority, application Japan, May 13, 1988, 63-18980
Term of patent 14 years
U.S. Cl. D13—133

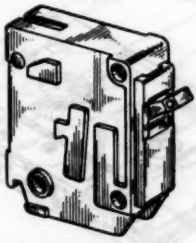


316,401
HOUSING FOR AN ELECTRICAL CONNECTOR
Hitoshi Sakai, Gotenba, Japan, assignor to Yazaki Corporation, Japan
Filed Oct. 7, 1988, Ser. No. 255,526
Claims priority, application Japan, Apr. 7, 1988, 63-13736
Term of patent 14 years
U.S. Cl. D13—146



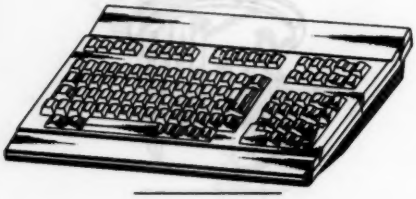
316,402
COVER FOR AN AUTOMOBILE-TYPE CIGARETTE LIGHTER RECEPTACLE
Larry Baker, 608 Albert Way, Petaluma, Calif. 94952
Filed Feb. 24, 1987, Ser. No. 18,184
Term of patent 14 years
U.S. Cl. D13—156

316,403
BREAKER CASE
James M. Mercer, Charlottesville, Va., and Keith A. Singer, Wilmington, N.C., assignors to Cooper Industries, Inc., Houston, Tex.
Filed Jun. 19, 1989, Ser. No. 368,018
Term of patent 14 years
U.S. Cl. D13—160

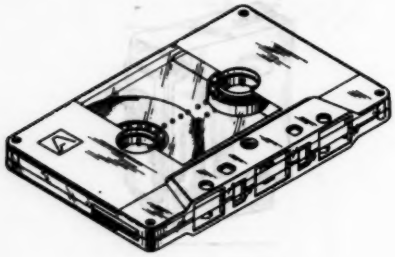


316,404
MAGNET
Ronald K. Calleja, 12 Primula Avenue, North Altona, Victoria 3025, Australia
Filed Jun. 13, 1988, Ser. No. 211,100
Claims priority, application Australia, Dec. 18, 1987, 4714/87
Term of patent 14 years
U.S. Cl. D13—183

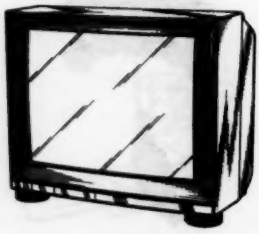
316,405
KEYBOARD FOR DATA PROCESSING SYSTEM
Isamu Yoshitake, Fuchu, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan
Filed Feb. 27, 1989, Ser. No. 316,451
Term of patent 14 years
U.S. Cl. D14—100



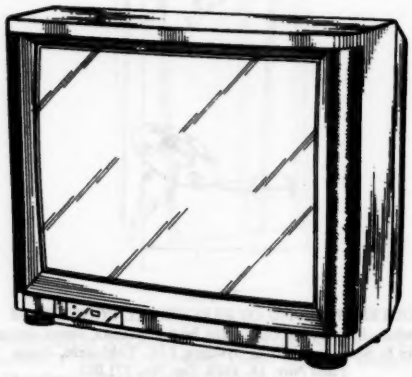
316,406
AUDIO CASSETTE
Fuyuki Yonehara, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Dec. 29, 1988, Ser. No. 291,877
Claims priority, application Japan, Jun. 29, 1988, 63-25956
Term of patent 14 years
U.S. Cl. D14—121



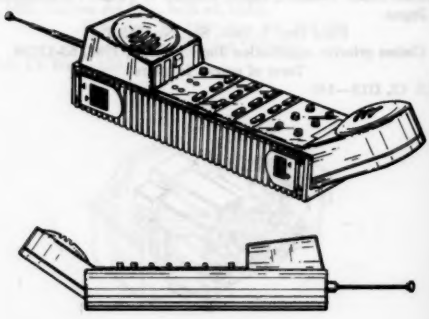
316,407
TELEVISION RECEIVER
Masao Yoshikawa, and Yuzo Fujii, both of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed May 31, 1989, Ser. No. 361,002
Claims priority, application Japan, Dec. 2, 1988, 63-47323
Term of patent 14 years
U.S. Cl. D14—126



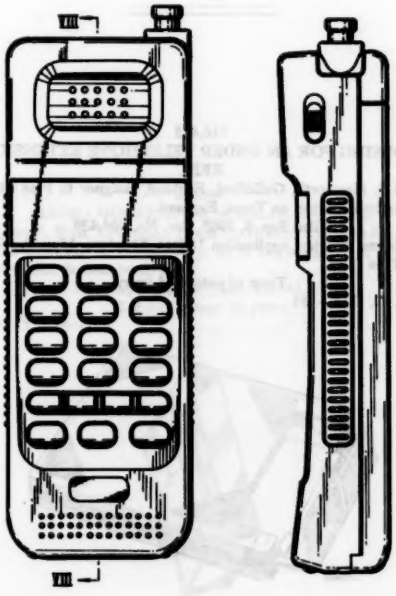
316,408
TELEVISION RECEIVER
Hiroyuki Tsubaki; Masao Yoshikawa, and Kazutoshi Masunari, all of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Jun. 6, 1989, Ser. No. 362,301
Claims priority, application Japan, Dec. 9, 1988, 63-48184
Term of patent 14 years
U.S. Cl. D14—126



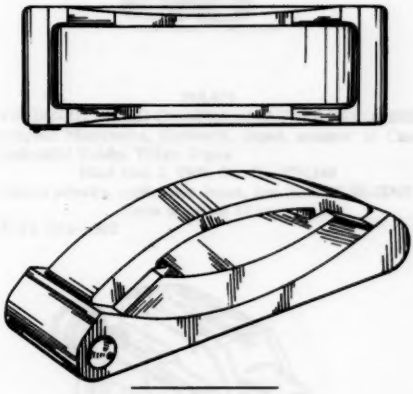
316,409
CORDLESS HANDSET TELEPHONE
David A. Sharbaugh, Irvine, Calif., assignor to PhoneMate, Torrance, Calif.
Filed Nov. 16, 1989, Ser. No. 437,974
Term of patent 14 years
U.S. Cl. D14—138



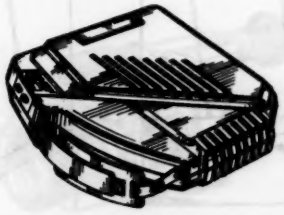
316,410
PORTABLE RADIO TELEPHONE
Katsuhito Watanabe, and Naoko Seki, both of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan
Filed Aug. 21, 1990, Ser. No. 571,092
Claims priority, application Japan, Feb. 21, 1990, 2-5181
Term of patent 14 years
U.S. Cl. D14—138



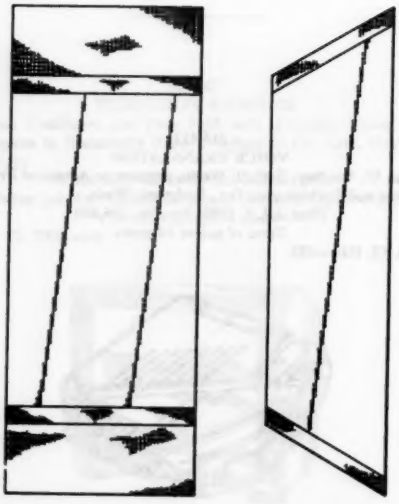
316,411
TELEPHONE
Comin Faliero, Pavia, Italy, assignor to Raina S.p.A., Rivoli Torino, Italy
Filed Jul. 6, 1990, Ser. No. 549,499
Claims priority, application Italy, Jan. 23, 1990, 52837/90[U]
Term of patent 14 years
U.S. Cl. D14—147



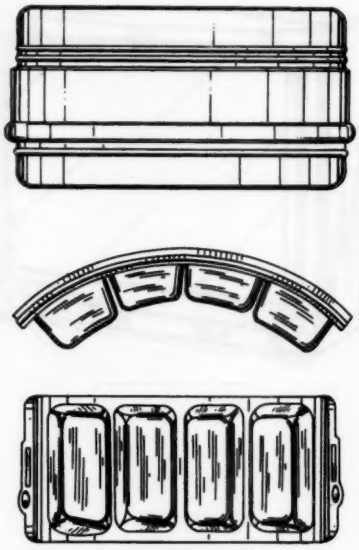
316,412
VOICE TRANSLATOR
Allen W. VanNoy, Bothell, Wash., assignor to Advanced Products and Technologies, Inc., Redmond, Wash.
Filed Jul. 5, 1988, Ser. No. 216,698
Term of patent 14 years
U.S. Cl. D14—158



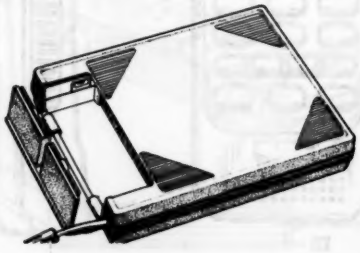
316,413
LOUDSPEAKER CABINET
Andrew E. Flanders, 570 N. 10th Ave., Cornelius, Oreg. 97113
Filed Jun. 25, 1987, Ser. No. 66,796
Term of patent 14 years
U.S. Cl. D14—214



316,414
CUSHION FOR ATTACHMENT TO THE ARCUATE HEADBAND CONNECTING THE EARPIECE MEMBERS OF A COMMUNICATIONS HEADSET
Domenic L. Fratantonio, and Robert E. Dalbec, both of Worcester, Mass., assignors to David Clark Company Incorporated, Worcester, Mass.
Filed Jan. 27, 1989, Ser. No. 302,731
Term of patent 14 years
U.S. Cl. D14—223



316,415
HOUSING FOR AN UNDER TELEPHONE EXTENSION REEL
Paul S. Hepworth, Guildford, England, assignor to Plas Plugs Limited, Burton on Trent, England
Filed Sep. 8, 1989, Ser. No. 404,439
Claims priority, application United Kingdom, Mar. 9, 1989, 1057746
Term of patent 14 years
U.S. Cl. D14—251



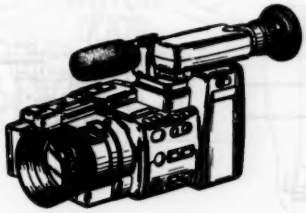
316,416
STAND FOR A PORTABLE TELEPHONE
Malcolm C. Cant, Wokingham, and Ron Major, Stroud, both of England, assignors to Technophone Limited, Surrey, England
Filed Jun. 7, 1989, Ser. No. 364,001
Claims priority, application United Kingdom, Jan. 31, 1989, 1056756
Term of patent 14 years
U.S. Cl. D14—252

316,417
RADIO HOUSING OR SIMILAR ARTICLE
Eugene J. Wall, LaGrange; Bruce D. Hillier, Hoffman Estates, and Terrance N. Taylor, Cary, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Apr. 27, 1987, Ser. No. 43,135
Term of patent 14 years
U.S. Cl. D14—299

316,418
TURBINE HOUSING
Steven R. Benson, 5919 S. 350 West, Murray, Utah 84107
Filed Jan. 17, 1989, Ser. No. 296,987
Term of patent 14 years
U.S. Cl. D15—5

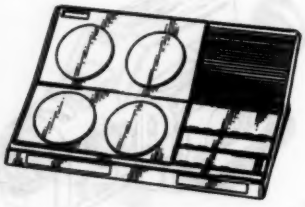
316,419
COMBINED VIDEO CAMERA AND TAPE RECORDER
Yoshiyuki Matsumura, Kunitachi, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 2, 1988, Ser. No. 279,149
Claims priority, application Japan, Jun. 6, 1988, 63-22369
Term of patent 14 years
U.S. Cl. D16—202

316,420
VIDEO CAMERA WITH VIDEO TAPE RECORDER
Chifuyu Tanaka, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Jun. 16, 1989, Ser. No. 367,102
Claims priority, application Japan, Dec. 19, 1988, 63-49434
Term of patent 14 years
U.S. Cl. D16—202

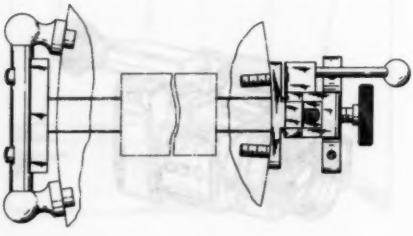


316,421
INFRARED IRRADIATION DEVICE FOR VIDEO CAMERA
Toru Shinano, Yokohama, and Kazuaki Sakuta, Koganei, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Feb. 2, 1988, Ser. No. 151,085
Claims priority, application Japan, Aug. 4, 1987, 62-31919
Term of patent 14 years
U.S. Cl. D16—237

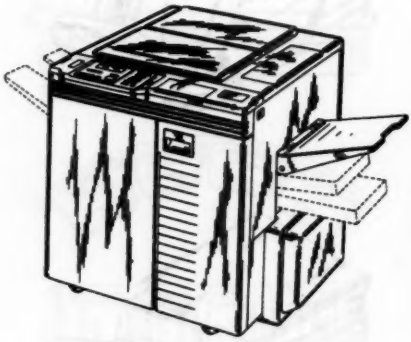
316,422
ELECTRONIC DRUM
Junko Mine, Hamamatsu, Japan, assignor to Yamaha Corporation, Japan
Filed Jun. 13, 1988, Ser. No. 207,438
Claims priority, application Japan, Dec. 10, 1987, 62-50520
Term of patent 14 years
U.S. Cl. D17—22



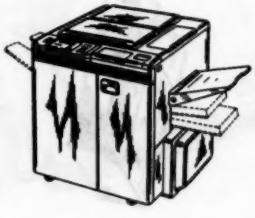
316,423
SNARE DRUM THROW OFF
Joseph P. Montineri, P.O. Box 3186, Dept. C, Vernon, Conn. 06066
Filed Jul. 12, 1988, Ser. No. 217,811
Term of patent 14 years
U.S. Cl. D17—22



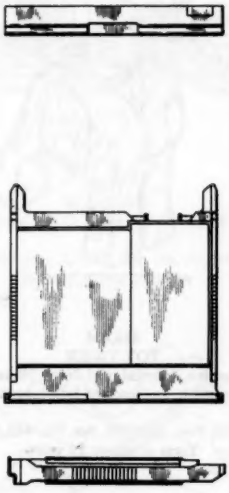
316,424
COPYING MACHINE
Takeshi Komada, Yokohama; Tomohiko Hirata, Kawasaki, and Minoru Aoyama, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Jul. 18, 1988, Ser. No. 220,111
Claims priority, application Japan, Jan. 19, 1988, 63-1809
The portion of the term of this patent subsequent to Apr. 23, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D18—39



316,425
COPYING MACHINE
Minoru Aoyama, Tokyo; Takeshi Komada, Yokohama, and Tomohiko Hirata, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Oct. 21, 1988, Ser. No. 260,490
Claims priority, application Japan, Apr. 25, 1988, 63-17020
The portion of the term of this patent subsequent to Apr. 23, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D18—39

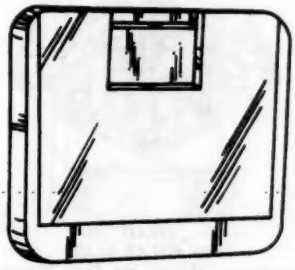


316,426
PAPER SUPPLY CASSETTE
Takeshi Komada, Yokohama, and Masataka Isomoto, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Jul. 19, 1988, Ser. No. 221,181
Claims priority, application Japan, Jan. 22, 1988, 63-2202
Term of patent 14 years
U.S. Cl. D18—44

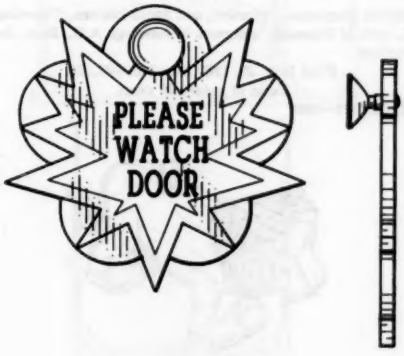


316,427
WRITING IMPLEMENT
Bernhard Tinz, Brunnwiesen 43 d, 7000 Stuttgart 75, BRD, Fed. Rep. of Germany
Filed Jul. 18, 1988, Ser. No. 220,845
Term of patent 14 years
U.S. Cl. D19—48

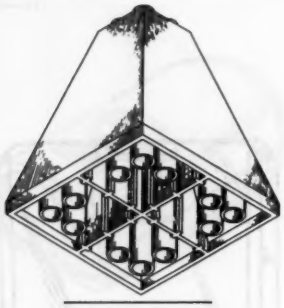
316,428
HEADER FOR A NEWSPAPER VENDING BIN OR SIMILAR ARTICLE
Milton J. Merl, New City, N.Y., assignor to Gannett Co., Inc., Arlington, Va.
Filed Aug. 14, 1987, Ser. No. 85,415
Term of patent 14 years
U.S. Cl. D20—8



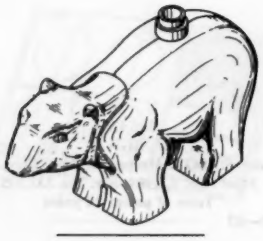
316,429
SIGN
David S. Gutierrez, 14771 Harper, Midway City, Calif. 92655
Filed Apr. 3, 1989, Ser. No. 332,105
Term of patent 14 years
U.S. Cl. D20—42



316,430
TOY BUILDING ELEMENT
Edel S. Andersen, Randbol, Denmark, assignor to Interlego AG, Baar, Switzerland
Filed May 9, 1989, Ser. No. 349,341
Term of patent 14 years
U.S. Cl. D21—108



316,431
TOY POLAR BEAR
Christian Stephensen, Marstal, and Jacob Nielsen, Copenhagens, both of Denmark, assignors to Interlego A.G., Baar, Switzerland
Filed Nov. 29, 1989, Ser. No. 443,224
Term of patent 14 years
U.S. Cl. D21—108

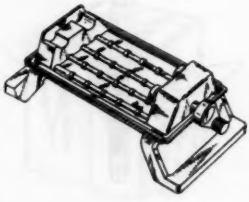


316,432
TOY LION
Christian Stephenson, Marstal, and Jacob Nielsen, Copenhagen S, both of Denmark, assignors to Interlego A.G., Baar, Switzerland
Filed Nov. 29, 1989, Ser. No. 443,226
Term of patent 14 years
U.S. Cl. D21—108

316,433
TOY GIRAFFE
Christian Stephensen, Marstal, and Jacob Nielsen, Copenhagens, both of Denmark, assignors to Interlego A.G., Baar, Switzerland
Filed Nov. 29, 1989, Ser. No. 443,228
Term of patent 14 years
U.S. Cl. D21—108

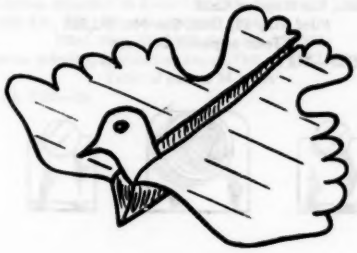
316,434
TOY TIGER
Christian Stephensen, Marstal, and Jacob Nielsen, Copenhagen S, both of Denmark, assignors to Interlego A.G., Baar, Switzerland
Filed Nov. 29, 1989, Ser. No. 443,229
Term of patent 14 years
U.S. Cl. D21—108

316,435
TOY COOKING GRILL
Janet E. Snell-Kelly, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Aug. 15, 1988, Ser. No. 232,583
Term of patent 14 years
U.S. Cl. D21—122



316,436
SPARKPLUG TOY CAR
Victor E. Franzone, 36 R.D. #2, Mertztown, Pa. 19539
Filed May 22, 1989, Ser. No. 354,938
Term of patent 14 years
U.S. Cl. D21—128

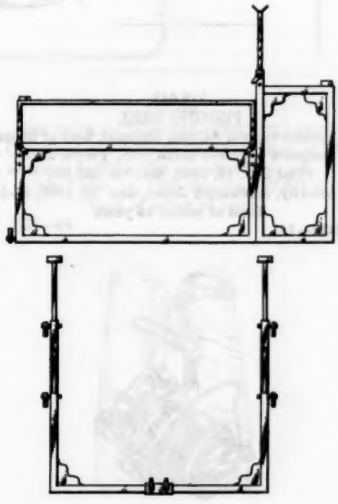
316,437
TOY BIRD
Jeffrey L. Peyton, P.O. Box C-32000, Richmond, Va. 23261-2000
Filed Jun. 2, 1987, Ser. No. 57,244
Term of patent 14 years
U.S. Cl. D21—160



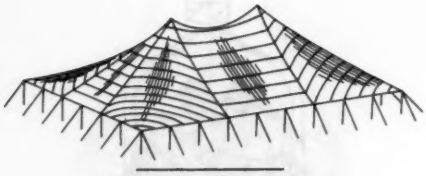
316,438
DOLL
Jerrie Waine, 121-E Crabapple La., Birmingham, Ala. 35214
Filed Sep. 26, 1988, Ser. No. 249,169
Term of patent 14 years
U.S. Cl. D21—171

316,439
COMBINED STUFFED TOY AND TRANSPARENT CONTAINER THEREFOR
Richard C. Arginsky, Ellenville, N.Y., assignor to The Plush Factory Inc., Ellenville, N.Y.
Filed Jan. 11, 1988, Ser. No. 142,847
Term of patent 14 years
U.S. Cl. D21—159

316,440
FREE WEIGHT SAFETY RACK
Mark E. Ekern, 207 N. Prarie, Flandreau, S. Dak. 57028
Filed Dec. 6, 1988, Ser. No. 280,522
Term of patent 14 years
U.S. Cl. D21—191



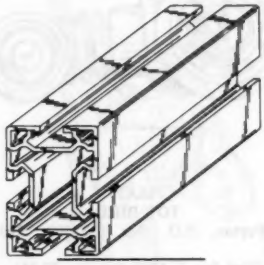
316,441
TENT
Todd Dalland, 110 Reade St., New York, N.Y. 10013
Division of Ser. No. 30,912, Mar. 26, 1987, Pat. No. D. 307,311. This application Feb. 5, 1990, Ser. No. 475,430
Term of patent 14 years
U.S. Cl. D21—253



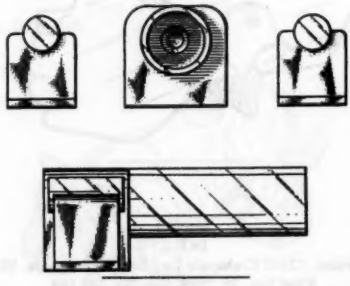
316,442
GUN
Thierry Guidat; Alain Lechelle, both of Mulhouse; Marc Renard, Pierrefitte, and Jean P. Puel, Puteaux, all of France, assignors to Matra Manurhin Defense, Velizy Villacoublay, France
Filed Apr. 6, 1988, Ser. No. 178,287
Term of patent 14 years
U.S. Cl. D22—104

316,443
FISHING REEL
Toshiaki Yoshikawa, and Akihisa Shiozaki, both of Musashino, Japan, assignors to Daiwa Seiko, Inc., Tokyo, Japan
Filed Dec. 19, 1988, Ser. No. 285,954
Claims priority, application Japan, Jun. 20, 1988, 63-24465
Term of patent 14 years
U.S. Cl. D22—141

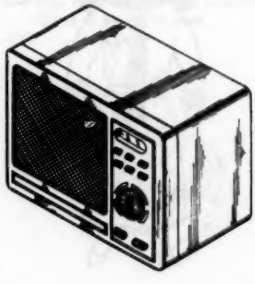
316,444
BEAM
Goran Abbestam, Landerigatan 2, S-416 70 Goteborg, and Leif Lachonius, Utsiktsliden 5, S-445 00 Surte, both of Sweden
Division of Ser. No. 368,527, Jun. 20, 1989. This application Jul. 26, 1990, Ser. No. 558,191
Claims priority, application Sweden, Dec. 21, 1988, 882944
Term of patent 14 years
U.S. Cl. D25—122



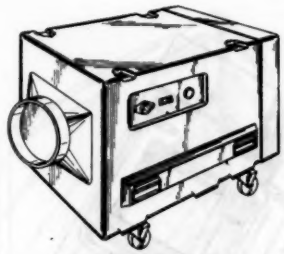
316,445
FAUCET SET
Regina Razumov, San Diego, Calif., assignor to Harden Industries, Inc., Los Angeles, Calif.
Filed May 11, 1988, Ser. No. 192,505
Term of patent 14 years
U.S. Cl. D23—242



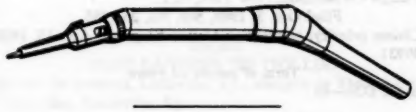
316,446
ELECTRIC HEATER
Wen T. Lee, Tainan, Taiwan, assignor to Caho-Yang Electric Mgf. Co., Ltd., Tainan, Taiwan
Filed Mar. 10, 1989, Ser. No. 321,336
Term of patent 14 years
U.S. Cl. D23—335



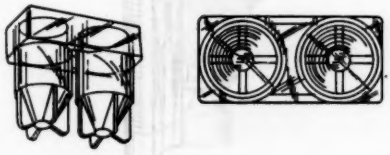
316,447
NEGATIVE PRESSURE AIR FILTRATION HOUSING
James C. Woodson; Ron W. Mumford, and Kenneth S. Kondo, all of Houston, Tex., assignors to Critical Industries, Inc., Houston, Tex.
Filed Sep. 19, 1989, Ser. No. 408,800
Term of patent 14 years
U.S. Cl. D23—365



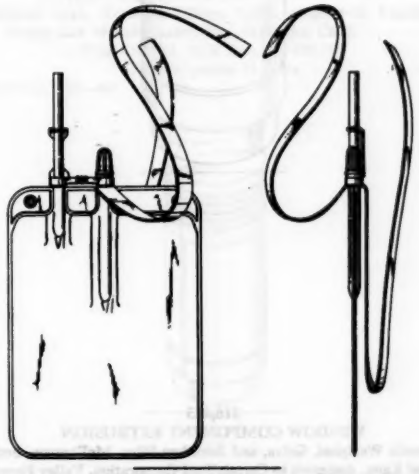
316,448
ULTRASONIC ASPIRATOR FOR MICROSCOPIC NEUROSURGERY
Masaichi Kijima, Tokyo, and Nobumichi Yajima, Nagano, both of Japan, assignors to Aloka Co., Ltd., Tokyo and Ueda Japan Radio Co., Ltd., Nagano, both of, Japan
Filed Mar. 31, 1988, Ser. No. 176,391
Claims priority, application Japan, Oct. 2, 1987, 62-40561
Term of patent 14 years
U.S. Cl. D24—26



316,449
DUAL RESERVOIR SAMPLE CUP
Michael D'Aquino, Miami, Fla., and Julius Becker, Cincinnati, Ohio, assignors to Baxter International Inc., Deerfield, Ill.
Division of Ser. No. 146,144, Jan. 15, 1988, Pat. No. Des. 309,779. This application May 14, 1990, Ser. No. 506,327
Term of patent 14 years
U.S. Cl. D24—29

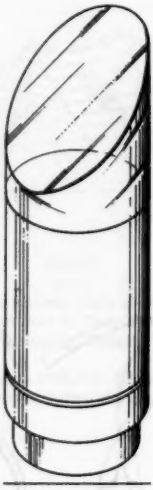


316,450
SURGICAL DRAINAGE CONTAINER
Kevin R. Baber, Folkestone, England, assignor to Smiths Industries Public Limited Company, London, England
Filed May 25, 1988, Ser. No. 198,819
Claims priority, application United Kingdom, Dec. 10, 1987, 1046997
Term of patent 14 years
U.S. Cl. D24—58

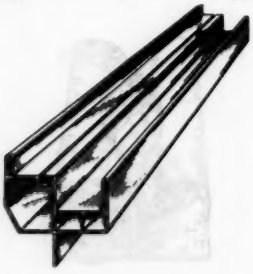


316,451
FOLDABLE CHIROPRACTIC PILLOW
Alan B. Carnathan, and Susan G. Carnathan, both of Edgemont, Ark., assignors to Slack, Inc., Greers Ferry, Ark.
Filed Mar. 14, 1988, Ser. No. 167,432
Term of patent 14 years
U.S. Cl. D24—64

316,452
OUTDOOR BOLLARD LIGHTING FIXTURE
Hiroshi Kira, Westlake Village, Calif., assignor to Lumiere Design and Manufacturing, Inc., Westlake, Calif.
Filed Oct. 13, 1989, Ser. No. 421,394
Term of patent 14 years
U.S. Cl. D26—68



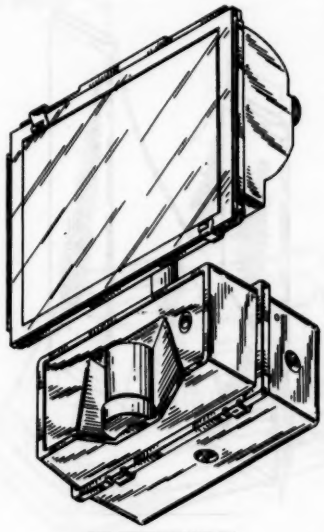
316,453
WINDOW COMPONENT EXTRUSION
Dennis Westphal, Galva, and Jonathan Piles, McPherson, both of Kans., assignors to CertainTeed Corporation, Valley Forge, Pa.
Filed Sep. 12, 1989, Ser. No. 406,112
The portion of the term of this patent subsequent to May 15, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D25—122



316,454
BATTERY OPERATED LIGHT FOR A HANDHELD COMPUTER GAME MACHINE SCREEN
Angelo Tortola, Lexington, and Robert Howitt, Leominster, both of Mass., assignors to Curtis Manufacturing Company, Inc., Jaffrey, N.H.
Filed Jun. 18, 1990, Ser. No. 540,501
Term of patent 14 years
U.S. Cl. D26—24

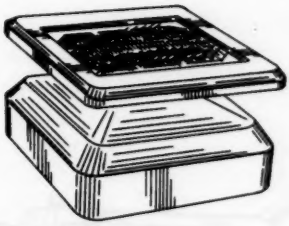
316,455
TORCH
Leonardus A. C. Krol, Gorinchem, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Oct. 3, 1988, Ser. No. 253,285
Claims priority, application United Kingdom, Apr. 13, 1988, 1049931
Term of patent 14 years
U.S. Cl. D26—44

316,456
COMBINED OUTDOOR FLOODLIGHT AND PHOTO ELECTRIC CONTROL THEREFOR
Giovanni De Candia, Germantown, Tenn., assignor to FL Industries, Inc., Livingston, N.J.
Filed Feb. 1, 1988, Ser. No. 151,244
Term of patent 14 years
U.S. Cl. D26—63



316,457
POST LANTERN OR THE LIKE
Robert De'Armond, Louisville, Ky., assignor to Thomas Industries Inc., Louisville, Ky.
Filed Jul. 6, 1987, Ser. No. 69,952
Term of patent 14 years
U.S. Cl. D26—67

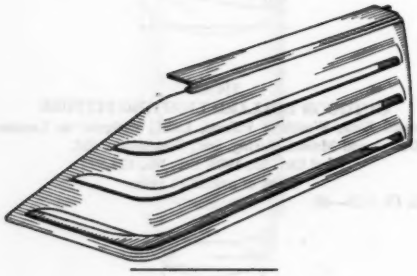
316,458
SOLAR POWERED OUTDOOR RECREATIONAL LAMP
James C. Spotts, Kowloon, and Haw R. Chai, Des Voeux, both of Hong Kong, assignors to Australux North America, Ltd., Hong Kong
Filed Oct. 3, 1989, Ser. No. 416,444
Term of patent 14 years
U.S. Cl. D26—67



316,459
OUTDOOR BOLLARD LIGHTING FIXTURE
Hiroshi Kira, Westlake Village, Calif., assignor to Lumiere Design and Manufacturing, Inc., Westlake, Calif.
Filed Oct. 13, 1989, Ser. No. 421,395
Term of patent 14 years
U.S. Cl. D26—68

316,460
SHIELD FOR PROTECTING A TRUCK DRIVING LIGHT FROM ROAD DAMAGE
Roy M. Neece, Rte. 9, Box 289V, Saginaw, Tex. 76179
Filed Aug. 30, 1988, Ser. No. 238,160
Term of patent 14 years
U.S. Cl. D26—139

316,461
PAIR OF LOUVERED TAIL LIGHT COVERS
Gregory A. McGlothlin, 625 Grand Mesa Ave., Grand Junction, Colo. 81503
Filed Oct. 14, 1988, Ser. No. 257,797
Term of patent 14 years
U.S. Cl. D26—139



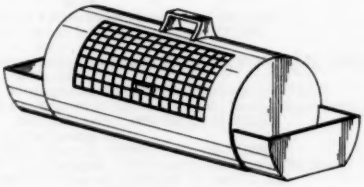
316,462
COSMETIC COMPACT
Frederico Restrepo, Paris, France, assignor to Societe D'Hygiene Dermatologique de Vichy, Vichy, France
Filed Feb. 27, 1989, Ser. No. 316,445
Claims priority, application Int'l Pat. Institute, Sep. 2, 1988, DM/01167,3
Term of patent 14 years
U.S. Cl. D28—83

316,463
CHEST RESTRAINT FOR SHOULDER HARNESS
Michael R. Gravel, Little Falls, N.Y., assignor to Tumble Forms, Inc., Dolgeville, N.Y.
Filed Apr. 4, 1988, Ser. No. 176,981
Term of patent 14 years
U.S. Cl. D29—10

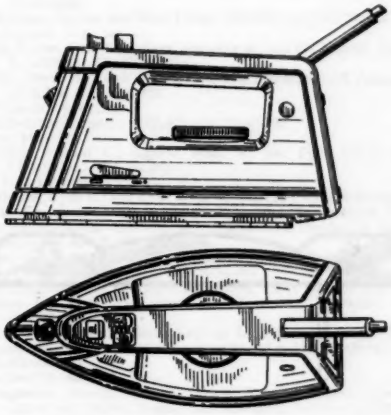
316,464
PET CUSHION
Peggy E. Kelley, 8202 Artie Kemp Rd., Frederick, Md. 21701
Filed Sep. 13, 1988, Ser. No. 243,775
Term of patent 14 years
U.S. Cl. D30—118

316,465
STEAM GENERATING MACHINE
Ulrich Reiferscheid, Ravensburg, Fed. Rep. of Germany, and Robin H. Spratt, Tyne & Wear, England, assignors to Black & Decker Inc., Newark, Del.
Continuation-in-part of Ser. No. 174,318, Mar. 25, 1988, abandoned. This application Oct. 17, 1988, Ser. No. 258,694
Claims priority, application United Kingdom, Sep. 28, 1987, 1045199; Apr. 26, 1988, 1050273
Term of patent 14 years
U.S. Cl. D32—17

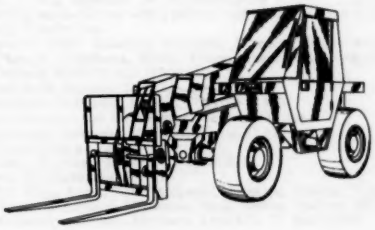
316,466
LAUNDRY CONTAINER
Michael J. Veasey, 15215 Thresch La., Webster, Tex. 77059
Filed Aug. 24, 1988, Ser. No. 235,646
Term of patent 14 years
U.S. Cl. D32—37



316,467
IRON
Lung W. Choi, Kowloon, Hong Kong, assignor to Goodway Electrical Co., Ltd., Kowloon, Hong Kong
Filed Sep. 6, 1989, Ser. No. 402,855
Claims priority, application United Kingdom, Mar. 10, 1989, 1057762
Term of patent 14 years
U.S. Cl. D32—70

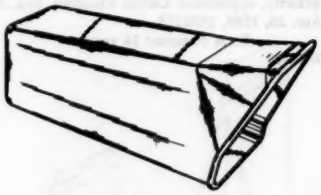


316,468
TELESCOPIC MATERIAL HANDLING VEHICLE
Dale D. Sandrock, Pekin, Ill.; Stephen H. Gill, Mentor; Llewellyn L. Walter, Chardon, both of Ohio; David P. Brown, Osmotherly, and James Wilson, Sunderland, both of United Kingdom, assignors to Caterpillar Industrial Inc., Mentor, Ohio
Filed Apr. 29, 1988, Ser. No. 187,784
Term of patent 14 years
U.S. Cl. D34—37

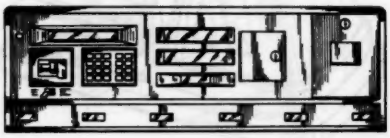


316,469
GRAVE MARKER
Armando Zapata, Box 428, Rosharon, Tex. 77583
Filed Jun. 22, 1988, Ser. No. 210,285
Term of patent 14 years
U.S. Cl. D99—18

316,470
NEWSPAPER BOX
Carl D. Fuemmeler, 1809 S. Morris, Mexico, Mo. 65265
Filed Jun. 10, 1987, Ser. No. 60,371
Term of patent 14 years
U.S. Cl. D99—29



316,471
CREDIT AND DEBIT AUTHORIZATION PANEL OR SIMILAR ARTICLE
Donald P. Austin, Jamestown; Albert L. Lawrence, Thomasville, and Arthur C. Prewitt, Julian, all of N.C., assignors to Gilbarco Inc., Greensboro, N.C.
Filed Jun. 24, 1988, Ser. No. 210,779
Term of patent 14 years
U.S. Cl. D99—43



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 23RD DAY OF APRIL, 1991

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A/S Ferrosan: *See*—
Braestrup, Claus T.; Nielsen, Mogens C.; Christensen, Joergen A.; Engelstoft, Mogens; Schou, Henning; Eder, Ulrich; Neef, Gunter; Huth, Andreas; Rahtz, Dieter; and Schmiechen, Ralph, 5,010,077, Cl. 514-228.800.

A. Stucki Company Division of Hansen, Inc.: *See*—
Wiebe, Donald, 5,009,521, Cl. 384-191.100.

Abb, Thomas: *See*—
Sacco, Bruno; Tomforde, Johann; Abb, Thomas; and Stenemann, Bruno, 5,009,042, Cl. 52-36.000.

Abbott Laboratories: *See*—
Brinker, Dale R.; and Reiland, Thomas L., 5,009,897, Cl. 424-469.000.

Abe, Akira, to Fuji Photo Film Co., Ltd. Method for processing silver halide photosensitive materials. 5,009,983, Cl. 430-372.000.

Abe, Nobuyuki: *See*—
Hasegawa, Takanori; Abe, Nobuyuki; Hibara, Toru; Hirose, Toshihiko; Kanda, Takashi; Saito, Hiroshi; Oshima, Masaki; and Nakazawa, Eiji, 5,010,420, Cl. 358-471.000.

Abe, Ryoji; Okita, Junichi; Miyagoshi, Katsunobu; and Hashiyama, Kouichi, to Mazda Motor Corporation. Crankshaft supporting structure for an internal combustion engine. 5,009,205, Cl. 123-195.00H.

Abe, Shigenobu: *See*—
Hayashi, Yasuyuki; and Abe, Shigenobu, 5,009,451, Cl. 280-724.000.

Abou-Gharbia, Magid A.; Yardley, John P.; and Childers, Wayne E., Jr., to American Home Products Corporation. Aryl- and heteroaryl piperazinyl carboxamides having central nervous system activity. 5,010,078, Cl. 514-252.000.

Abou-Issa, Hussein M.: *See*—
Minton, John P.; Webb, Thomas E.; and Abou-Issa, Hussein M., 5,010,107, Cl. 514-578.000.

Abraham, Martin J., III. System for cooling beer for remote dispensing. 5,009,082, Cl. 62-390.000.

Abu-Isa, Ismat A.; Eusebi, Elio; Jaynes, Craig B.; Moran, Susan C.; and Roy, Michael A., to General Motors Corporation. Process for forming an elastomeric membrane. 5,009,827, Cl. 264-156.000.

Abu-Isa, Ismat A., to General Motors Corporation. Dual modulus oriented elastomeric filaments. 5,009,955, Cl. 428-401.000.

Acrymet Industries Inc.: *See*—
Paul, Stanley, 5,009,048, Cl. 52-308.000.

Adanlock: *See*—
Roller, Timothy J.; and Thiele, Robert E., 5,009,470, Cl. 312-325.000.

ADC Telecommunications, Inc.: *See*—
Werdin, David A.; and Henke, Reinhold, 5,010,450, Cl. 361-415.000.

Adelson, Edward H.: *See*—
Schreiber, William F.; Lippman, Andrew B.; Adelson, Edward H.; and Netravali, Aran N., 5,010,405, Cl. 358-141.000.

Adler, Robert: *See*—
Petrik, Michael A.; Adler, Robert J.; and Wineland, Jonathan D., 5,009,796, Cl. 210-787.000.

Adler, Robert J.: *See*—
Petrik, Michael A.; Adler, Robert J.; and Wineland, Jonathan D., 5,009,796, Cl. 210-787.000.

Advance Display Technologies, Inc.: *See*—
Knudson, Steven B., 5,009,475, Cl. 350-96.100.

Advanced Energy Industries, Inc.: *See*—
Siefkes, Jerry D.; Harpold, John G.; and Schatz, Douglas S., 5,009,764, Cl. 204-298.080.

Advanced Environmental Research Group: *See*—
Gerritsen, Hendrik J., 5,009,484, Cl. 350-162.110.

Advanced Micro Devices, Inc.: *See*—
Allen, Bert L.; Gwozdz, Peter S.; and Bowers, Thomas R., 5,010,024, Cl. 437-24.000.
Itoh, Tatsuo, 5,010,561, Cl. 377-47.000.
Liu, Yow-Juang (Bill); and Hadjizadeh-Amini, Zahra, 5,010,029, Cl. 437-44.000.

Advanced Technologies Management, Inc.: *See*—
Hise, Ralph E., 5,009,763, Cl. 204-255.000.

AE PLC: *See*—
Beaurepaire, Olivier; and Thompson, Frederick H., 5,009,124, Cl. 74-595.000.

AEG Westinghouse Transportation Systems, Inc.: *See*—
Karg, Kenneth A.; Hvozda, Carl K.; Neddermeyer, Robert N.; and Feld, Alexander, 5,009,148, Cl. 98-10.000.

Aeolian Partnership: *See*—
Smith, Raoul D., 5,009,571, Cl. 416-79.000.

Aerolux Produktions- und Handelsgesellschaft mbH: *See*—
Miloslaus, Ludwig, 5,009,259, Cl. 160-323.100.

Afromowitz, Martin A., to University of Washington, Board of Regents of the. Method of monitoring solidification of a liquid composition. 5,009,102, Cl. 73-590.000.

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Kosugi, Yoshitsugu; Tanaka, Hideoki; Suzuki, Hideo; and Shiraki, Masaru, 5,010,004, Cl. 435-134.000.

Agfa Gevaert Aktiengesellschaft: *See*—
Grigat, Ernst; Meckel, Walter; and Nippe, Burkhard, 5,009,925, Cl. 427-48.000.
Kunitz, Friedrich-Wilhelm; and Wichmann, Ralf, 5,009,985, Cl. 430-430.000.
Scheerer, Rainer; and Moll, Franz, 5,009,990, Cl. 430-539.000.

Agfa-Gevaert, N.V.: *See*—
De Rycke, Gino L.; Rutges, Antonius A.; and De Prijcker, Jozef P., 5,009,984, Cl. 430-404.000.
Nys, Pierre H.; Vinck, Paul W.; and von Erdmannsdorff, Andreas, 5,010,398, Cl. 358-80.000.

Agip Petroli S.p.A.: *See*—
Brandolese, Ernesto, 5,009,803, Cl. 252-49.500.

Agnew, Marc N.: *See*—
Allen, Richard C.; Agnew, Marc N.; and Fink, David M., 5,010,083, Cl. 514-292.000.

Agri-Tech Incorporated: *See*—
Chance, Lynn C.; and Low, John A., 5,009,307, Cl. 198-538.000.

Ahmad, Jameel; and Valenza, Joseph P., to High Technologies, Inc. Reinforced asphalt concrete and structure for producing same. 5,009,543, Cl. 404-70.000.

Ahmad, Mohammad R.; and Barke, Oscar A., to Floss Products Corporation. Dentifrice. 5,009,886, Cl. 424-58.000.

Ahmed, Hassan J., to Westinghouse Electric Corp. Nuclear fuel rod helium leak inspection apparatus and method. 5,009,835, Cl. 376-251.000.

Ahmed, Salah H.; and Luksas, Anthony J., to Dairy Research, Inc. Cheese-like spread composition and method of making. 5,009,913, Cl. 426-581.000.

Aichi Steel Works, Ltd.: *See*—
Sugimoto, Atsushi; Nakano, Osamu; Yasuda, Shigeru; Maeda, Chikatoshi; Ozone, Toshio; and Kawagoe, Makoto, 5,009,843, Cl. 420-112.000.

Aichi Steel Works, Ltd: *See*—
Honkura, Yoshinobu; Matsuo, Toru; and Murata, Kouji, 5,009,723, Cl. 148-12.00E.

Aikoh Co., Ltd.: *See*—
Iwahashi, Takashi, 5,009,887, Cl. 424-76.100.

Air Products and Chemicals, Inc.: *See*—
Angus, Richard O.; and Yacoub, Kahlil, 5,009,679, Cl. 55-16.000.
Ellison, Thomas L.; Roberts, David A.; Ivankovits, John C.; and Norman, John A. T., 5,009,725, Cl. 148-23.000.
Famili, Amir F.; Marten, F. Lennart; and Mohanty, Dillip K., 5,010,153, Cl. 526-243.000.

Aisan Kogyo Kabushiki Kaisha: *See*—
Hanai, Kazumichi; Mine, Koichi; and Kikuta, Hikaru, 5,009,575, Cl. 417-244.000.

Aisin-AW Kabushiki Kaisha: *See*—
Harada, Kyouji; Kato, Eiji; Sakaguchi, Yoshikazu; Watanabe, Suzuaki; and Hoshino, Akira, 5,009,290, Cl. 188-71.500.

Aisin Seiki K.K.: *See*—
Sumi, Chiaki; and Kuwayama, Wataru, 5,010,212, Cl. 174-52.200.

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Kuki, Nobuyuki; Isomura, Yukio; Suzumura, Hirokazu; Sakakibara, Yoshikazu; and Ishihara, Hiroshi, 5,009,035, Cl. 49-352.000.

Akana, Yoshinori: *See*—
Kohsaka, Masaki; Higashi, Isaburou; Akana, Yoshinori; Hashimoto, Mikio; and Yatsu, Tadao, 5,010,146, Cl. 525-439.000.

Akazawa, Hiroyuki; and Imae, Toshihiro, to Seiko Epson Corporation. Paper feeding apparatus for accommodating different lengths of recording media for use with a printer. 5,009,532, Cl. 400-636.200.

Akazawa, Hitoshi: *See*—
Sasame, Akira; Sakanoue, Hitoyuki; Takeuchi, Hisao; Miyake, Masaya; Yamakawa, Akira; Yushio, Yasuhisa; and Akazawa, Hitoshi, 5,010,388, Cl. 357-70.000.

Akebono Brake Industry Co., Ltd.: *See*—
Takahashi, Nobuyuki, 5,009,293, Cl. 188-72.400.

Akebono Research and Development Centre Ltd.: *See*—
Takahashi, Nobuyuki, 5,009,293, Cl. 188-72.400.

Aker Engineering a.s.: *See*—
Brekke, Kristian, 5,009,680, Cl. 55-40.000.

Akiyama, Masakazu: *See*—
Mori, Kinji; Kunai, Yuko; Akiyama, Masakazu; Kadoya, Tadaaki; Kawano, Katsumi; Miyamoto, Shoji; Nohmi, Makoto; Shingai, Sadanori; and Ihara, Hirokazu, 5,010,479, Cl. 364-200.000.

Akizawa, Nobuyuki; Kudo, Yasunori; Kanai, Toshiyuki; Kamei, Yasuo; Oyama, Nobuaki; and Negishi, Akihito, to Max Co., Ltd. Electric stapler. 5,009,355, Cl. 227-114.000.

Akva A/S: *See*—
Molaug, Ole; and Risa, Steinar, 5,009,908, Cl. 426-454.000.

Akzo N.V.: *See*—
Becker, John W., 5,009,896, Cl. 424-467.000.
Roos, Antonius, 5,009,829, Cl. 264-210.600.
Sikkema, Doetze J., 5,010,168, Cl. 528-338.000.

Albar: *See*—
Bobry, Howard H., 5,010,469, Cl. 363-37.000.

Alberta Energy Company Ltd.: *See*—
Schramm, Laurier L.; and Smith, Russell G., 5,009,773, Cl. 208-391.000.

Albino, Anthony; Lloyd, Kenneth; Ikeda, Hisami; and Old, Lloyd, to Sloan-Kettering Institute for Cancer Research. Monoclonal antibodies to melanoma cells. 5,009,995, Cl. 435-7.230.

Albinson, Rosemary B., to XAAR Limited. Method of forming an adherent fluorosilane layer on a substrate and ink jet recording head containing such a layer. 5,010,356, Cl. 346-140.00R.

Alcan International Limited: *See*—
Apte, Prasad S.; and Pant, Aniket, 5,010,220, Cl. 219-10.55M.

Alcatel Cit: *See*—
Jacob, Jean-Baptiste, 5,010,545, Cl. 370-56.000.

Alcatel Espace: *See*—
Rene, Didier; Dusseux, Thierry; and Ginestet, Philippe, 5,010,348, Cl. 343-700.0MS.

Alestrom, Peter: *See*—
Gautvik, Kaare M.; Alestrom, Peter; Oven, Tordis B.; and Gabrielsen, Odd S., 5,010,010, Cl. 435-252.300.

Alfa Wasserman S.p.A.: *See*—
Piani, Silvano; Tamagnone, Gianfranco; Alpino, Raul R.; Milani, Maria R.; and Fantuz, Marinella, 5,010,063, Cl. 514-56.000.

Alferness, Rodney C.; Budrikis, Zigmantas L.; Hagelbarger, David W.; Kogelnik, Herwig W.; and Netravali, Arun N., to AT&T Bell Laboratories. Optical interconnect arrangement. 5,009,477, Cl. 350-96.150.

Allen, Bert L.; Gwozdz, Peter S.; and Bowers, Thomas R., to Advanced Micro Devices, Inc. Passivation for integrated circuit structures. 5,010,024, Cl. 437-24.000.

Allen, Ernie L.: *See*—
Johnson, Harlan B.; Wiedrich, Charles R.; Allen, Ernie L.; and Howell, Peter P., 5,009,806, Cl. 252-187.280.

Allen, Richard C.; Agnew, Marc N.; and Fink, David M., to Hoechst-Roussel Pharmaceuticals, Inc. 2,6-methano-1,3-benzodiazocine compounds which have useful pharmaceutical utility. 5,010,083, Cl. 514-292.000.

Allen, Tate C. Aquatic amusement device. 5,009,413, Cl. 272-1.00B.

Allenson, Stephan J.: *See*—
Williamson, Charles D.; Allenson, Stephan J.; and Gabel, Robert K., 5,009,267, Cl. 166-271.000.

Allied-Signal Inc.: *See*—
Banik, Anthony, 5,009,704, Cl. 75-238.000.
Baughman, Ray H.; Buff, Ernest D.; Eckhardt, Helmut; and Fuchs, Gerhard H., 5,009,044, Cl. 52-171.000.
Damgaard-Iversen, Karsten; Morris, Robert C.; Chin, Timothy C.; and Kuper, Jerry W., 5,009,658, Cl. 606-128.000.

Alpha Industries, Inc.: *See*—
Nolan, John H.; and Skvarce, Dennis H., 5,009,140, Cl. 83-698.000.

Alpine Electronics Inc.: *See*—
Kobari, Tadaomi, 5,010,448, Cl. 361-403.000.

Alpino, Raul R.: *See*—
Piani, Silvano; Tamagnone, Gianfranco; Alpino, Raul R.; Milani, Maria R.; and Fantuz, Marinella, 5,010,063, Cl. 514-56.000.

Alps, Brian J.: *See*—
Pascal, Jean C.; Lee, Chi-Ho; Alps, Brian J.; Pinhas, Henri; and Whiting, Roger L., 5,010,075, Cl. 514-218.000.

Alps Electric Co., Ltd.: *See*—
Hatanaka, Sunao, 5,010,365, Cl. 355-211.000.
Kato, Takafumi, 5,010,219, Cl. 200-408.000.

Alquist, John W., to Lake Shore, Inc. Cable tensioning device. 5,009,353, Cl. 226-172.000.

Alt, Eckhard. For the thermodilution method of determining cardiac output. 5,009,234, Cl. 128-672.000.

Alting, Cornelis L.: *See*—
Haisma, Jan; Alting, Cornelis L.; and Michielsen, Theodorus M., 5,009,689, Cl. 65-33.000.

Alto, Brian J.; and Alto, Gregory F. Roof shingle stripper apparatus. 5,009,131, Cl. 81-45.000.

Alto, Gregory F.: *See*—
Alto, Brian J.; and Alto, Gregory F., 5,009,131, Cl. 81-45.000.

Ameda AG: *See*—
Riedweg, Robert; and Schlensog, Klaus, 5,009,638, Cl. 604-74.000.

Amemiya, Koji: *See*—
Takeuchi, Tatsuo; and Amemiya, Koji, 5,009,945, Cl. 428-76.000.

American Cyanamid Company: *See*—
Brady, Thomas E.; Condon, Michael E.; and Marc, Pierre A., 5,009,699, Cl. 71-92.000.
Brown, Dale G.; Siddens, Jack K.; Diehl, Robert E.; and Wright, Donald P., Jr., 5,010,098, Cl. 514-426.000.

American Home Products Corporation: *See*—
Abou-Gharbia, Magid A.; Yardley, John P.; and Childers, Wayne E., Jr., 5,010,078, Cl. 514-252.000.
Felman, Steven W.; Jirkovsky, Ivo L.; and Memoli, Kevin A., 5,010,102, Cl. 514-473.000.

American Language Academy: *See*—
Willetts, John A., 5,010,495, Cl. 364-513.500.

American Maize-Products Company: *See*—
Mauro, David J.; Furcsik, Susan L.; Katz, Frances R.; Faron, Eugene J., II; Gottneid, David J.; and Pustek, Frank J., 5,009,911, Cl. 426-578.000.

American Standard Inc.: *See*—
Cocciadiferro, Michael J.; and De Serio, Robert J., 5,009,059, Cl. 53-472.000.
Okoren, Ronald W., 5,009,075, Cl. 62-127.000.

Ames, Wilbur R., IV: *See*—
Eilert, Randall N.; Neel, Robert M.; Harvey, N. Thatcher; Ames, Wilbur R., IV; and Lord, Randall D., 5,008,974, Cl. 16-114.00R.

Ametani, Minoru; Funakoshi, Keigo; Kira, Akihiko; Matsushita, Takao; and Shirakura, Keizo, to Nitto Denko Corporation. Process for peeling protective film off a wafer. 5,009,735, Cl. 156-241.000.

Amoco Corporation: *See*—
Clark, Frederick T.; Hensley, Albert L., Jr.; Lyzinski, David; and Peck, Lawrence B., 5,009,771, Cl. 208-216.0PP.
Miller, Jeffrey T.; and Hensley, Albert L., Jr., 5,009,770, Cl. 208-209.000.
Park, Chang M., 5,010,207, Cl. 549-245.000.

AMP Incorporated: *See*—
Correll, Robert S., Jr.; and Wiltraut, David D., 5,008,999, Cl. 29-882.000.
Fogg, Michael W.; Koegel, Keith S.; Shuey, John R.; Zelko, William E.; and Beamenderfer, Robert E., 5,009,614, Cl. 439-497.000.
Fogg, Michael W.; and Morningstar, Leroy J., 5,009,616, Cl. 439-608.000.
Henschen, Homer E.; McKee, Michael J.; and Pawlikowski, Joseph M., 5,010,233, Cl. 219-209.000.
Shipe, Joanne E., 5,009,608, Cl. 439-331.000.

Ampex Corporation: *See*—
Trytko, David E., 5,010,407, Cl. 358-183.000.

Analog Devices, Incorporated: *See*—
Babcock, Douglas W., 5,010,297, Cl. 324-158.00R.
Hisano, Shinichi; Ganesan, Apparajan; and Guy, Thomas S., 5,010,337, Cl. 341-154.000.

Anchor Hocking Corporation: *See*—
Ochs, Charles S., 5,009,324, Cl. 215-276.000.

Andersen, Niels J., to Cabinnovent ApS. Device for the heating or cooling of food-stuffs. 5,009,150, Cl. 99-360.000.

Andersen, Peter H.: *See*—
Gronwald, Frederik; Andersen, Peter H.; Faarup, Peter; Guddal, Erling; Hansen, Kristian T.; Hansen, Louis B.; and Nielsen, Erik B., 5,010,074, Cl. 514-213.000.

Andersson, Henry, to Vaisala Oy. Method and device in the antenna and receiving system of a radio theodolite. 5,010,343, Cl. 342-432.000.

Ando, Yasunori: *See*—
Ogata, Kiyoshi; Ando, Yasunori; and Kamijo, Eiji, 5,009,923, Cl. 427-38.000.

Ando, Yoshihira: *See*—
Ueda, Makoto; Ando, Yoshihira; Sakurai, Shungo; and Yoshioka, Ritsuo, 5,009,840, Cl. 376-435.000.

Andre, Gerald: *See*—
Ergan, Francoise; Trani, Michael; and Andre, Gerald, 5,010,006, Cl. 435-177.000.

Andrew Corporation: *See*—
Lipkin, Charles L.; and Jones, Marianne, 5,010,350, Cl. 343-704.000.

Andrews, Claude R.: *See*—
Wason, Satish K.; Mooney, Gerry; Andrews, Claude R.; Tarquini, Michael E.; Kosin, John A.; and Garcia, Rod A., 5,009,810, Cl. 252-350.000.

Angst, Christof: *See*—
Herold, Peter; and Angst, Christof, 5,010,189, Cl. 544-174.000.

Angus, Richard O.; and Yacoub, Kahlil, to Air Products and Chemicals, Inc. Membranes formed from rigid aromatic polyimide polymers. 5,009,679, Cl. 55-16.000.

Anthony, Mark C.: *See*—
Farrell, Jonathon E.; and Anthony, Mark C., 5,010,215, Cl. 200-50.00A.

Antonaroli, Simonetta; Bianco, Armandodariano; Brufani, Mario; Lo Baido, Giuseppe; and Rende, Giorgio, to Instituto Chimico Internazionale Dr. Giuseppe Rende S.r.l. Acetazolamide-related compounds, process for their preparation, and pharmaceutical composition containing the same. 5,010,204, Cl. 548-128.000.

Antonelli, Joseph A.; Scopazzi, Christopher; and Doherty, Mark M., to Du Pont de Nemours, E. I., and Company. Process for preparing stabilized polymer dispersion. 5,010,140, Cl. 525-269.000.

Ao, Masahiro: *See*—
Taguchi, Akira; Morita, Shigetoshi; Taka, Shunichi; Yamada, Hirohide; Takada, Yoshiaki; Furuichi, Shinji; and Ao, Masahiro, 5,010,429, Cl. 360-103.000.

Aoki, Akio: *See*—
Enari, Masahiko; Shikichi, Satoshi; Kawaguchi, Fumiaki; Suzuki, Kenichi; Usui, Masayuki; Matsuoka, Hiroshi; Matsuoka, Kazuhiko; Hosoya, Hideki; Aoki, Akio; and Minoura, Kazuo, 5,010,534, Cl. 369-32.000.

Aoki, Hiroatsu: *See*—
Kinoshita, Kitoshi; and Aoki, Hiroatsu, 5,009,481, Cl. 350-96.180.

Aoki, Kozo; and Takahashi, Osamu, to Fuji Photo Film Co., Ltd. Silver halide photographic material. 5,009,989, Cl. 430-512.000.

Aoki, Masaaki; Kamiyama, Masayuki; Asai, Kiyotsugu; and Yamaguchi, Akihiro, to Mitsui Toatsu Chemicals, Inc. Polyaldimine derivatives. 5,010,161, Cl. 528-59.000.

Application Des Gaz: *See*—
Roldan, Antoine; and Demilliere-Vergnais, Daniel, 5,009,592, Cl. 432-222.000.

Apte, Prasad S.; and Pant, Aniket, to Alcan International Limited. Process and apparatus for heating bodies at high temperature and pressure utilizing microwave energy. 5,010,220, Cl. 219-10.55M.

Arai, Kunio; and Kanaya, Yasuhiko, to Hitachi Seiko, Ltd. Method of and apparatus for perforating printed circuit board. 5,010,232, Cl. 219-121.700.

Arai, Takeshi, to Sanyo Electric Co., Ltd. Variable speed sound reproducing apparatus for sound reproduction and review system. 5,010,421, Cl. 360-32.000.

Arai, Yoshiaki: *See*—
Kida, Michio; Arai, Yoshiaki; and Sahira, Kensho, 5,009,862, Cl. 422-249.000.

Arai, Yuji; Shin, Yuaki; Ishiguro, Takashi; and Hamada, Emiko, to Taiyo Yuden Co., Ltd. Method of manufacturing an optical information recorded disc. 5,009,818, Cl. 264-1.003.

Arakawa, Yoshiki, to Matsushita Electric Industrial Co., Ltd. Three-dimensional geometry processing method and apparatus therefor. 5,010,501, Cl. 364-522.000.

Aratani, Shin-ichi, to Central Glass Company, Limited. Method of bending glass plate. 5,009,6^01, Cl. 65-106.000.

Araya, Junji; Ohzeki, Yukihiro; Miyamoto, Toshio; Hiroshima, Koichi; Sato, Yasushi; and Nakahata, Kimio, to Canon Kabushiki Kaisha. Transfer apparatus and image bearing apparatus using same having transfer means for contacting a backside of a transfer material. 5,010,370, Cl. 355-274.000.

Arch Development Corporation: *See*—
Maroni, Victor A., 5,010,053, Cl. 505-1.000.

Arco Chemical Technology, Inc.: *See*—
Schuchardt, Jonathan L., 5,010,047, Cl. 502-24.000.

Arditty, Herve ; and Lefevre, Hevre , to Thomson-CSF. Monomode optical fiber ring interferometric device with semiconductor diode as light energy emission-reception/amplification means. 5,009,504, Cl. 356-350.000.

Arizona Instrument Corp.: *See*—
Bell, William E.; and McNerney, John J., 5,010,021, Cl. 436-120.000.

Armour, Thomas W., II. Multi-purpose fastening device. 5,008,987, Cl. 24-442.000.

Armstrong, Gordon P.: *See*—
Pollet, Jean-Claude; Williams, Gary L.; Armstrong, Gordon P.; and Miller, David G., 5,009,941, Cl. 428-36.300.

Arnold, Edward: *See*—
Arnold, Lawrence J., 5,009,135, Cl. 81-488.000.

Arnold, Lawrence J., to Arnold, Edward. Brake adjustment tool. 5,009,135, Cl. 81-488.000.

Arns, James A.: *See*—
Shih, I-Fu; Chang, David B.; Arns, James A.; Moss, Gaylord E.; and Smith, Ronald T., 5,009,502, Cl. 356-152.000.

Aronoff, Marvin S.; Keyes, Denis E.; and Hahn, Robert C., Sr., to E. R. Squibb & Sons, Inc. Starch containing film ostomy pouches. 5,009,648, Cl. 604-332.000.

Arora, Sudershan K.: *See*—
Ronsen, Bruce; Arora, Sudershan K.; and Thomas, Albert V., 5,010,058, Cl. 514-23.000.

Arrington, Stephen T.; and Bradley, Gary W., to Halliburton Company. Process for removing copper and copper oxide deposits from surfaces. 5,009,714, Cl. 134-2.000.

Arthur Guinness Son & Company (Dublin) Limited: *See*—
Byrne, William J., 5,009,901, Cl. 426-112.000.

Arthur, James C.: *See*—
Howe, Michael G.; Arthur, James C.; and Usleman, Robert T., 5,009,065, Cl. 60-288.000.

Arthurs, Raymond C., to Saepter Manufacturing Company Limited. Bottle carrier assembly. 5,009,314, Cl. 206-427.000.

Arvidson, Arvid N.; Dosaj, Vishu D.; and May, James B., to Dow Corning Corporation. Silicon smelting process in direct current furnace. 5,009,703, Cl. 75-10.360.

Arvin Industries, Inc.: *See*—
Howe, Michael G.; Arthur, James C.; and Usleman, Robert T., 5,009,065, Cl. 60-288.000.

Asahi Glass Company, Ltd.: *See*—
Nakanishi, Kazuki, 5,009,688, Cl. 65-18.300.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See*—
Misawa, Masayuki, 5,010,357, Cl. 354-159.000.
Morimoto, Akira, 5,009,472, Cl. 350-6.500.

Asahi, Naotatsu: *See*—
Iizuka, Nobuyuki; Hirose, Fumiyuki; Asahi, Naotatsu; and Kojima, Yoshitaka, 5,009,070, Cl. 60-753.000.

Asai, Hiromitsu: *See*—
Takajo, Toshimi; Asai, Hiromitsu; and Haginuma, Kiyoshi, 5,009,520, Cl. 384-100.000.

Asai, Kenji, to Kabushiki Kaisha Toshiba. Access controller for controlling the seek operation of a head relative to a recording medium. 5,010,425, Cl. 360-78.040.

Asai, Kiyotsugu: *See*—
Aoki, Masaaki; Kamiyama, Masayuki; Asai, Kiyotsugu; and Yamaguchi, Akihiro, 5,010,161, Cl. 528-59.000.

Asai, Kohtaro: *See*—
Murakami, Tokumichi; Asai, Kohtaro; Kamizawa, Koh; Nishida, Masami; Yamazaki, Eizo; Itoh, Atsushi; and Kinjoh, Naoto, 5,010,401, Cl. 358-136.000.

Asami, Motomu: *See*—
Marutake, Yozo; Fukutome, Tatsuro; and Asami, Motomu, 5,010,575, Cl. 381-68.000.

Asano, Masamichi: *See*—
Minagawa, Hidenobu; Tatsumi, Yuuichi; Iwahashi, Hiroshi; Asano, Masamichi; Nakai, Hiroto; and Imai, Mizuho, 5,010,520, Cl. 365-174.000.

Asanuma, Masato; and Kaneshige, Masatoshi, to Sharp Kabushiki Kaisha. Developing device with shutter. 5,009,187, Cl. 118-658.000.

Asao, Kouichiro: *See*—
Ohmae, Tadayuki; Sakurai, Tadashi; and Asao, Kouichiro, 5,009,951, Cl. 428-294.000.

Asche, James E., to Clark Equipment Company. Retractable boom stop. 5,009,566, Cl. 414-722.000.

Asea Brown Boveri Limited: *See*—
Mechtersheimer, Gunter, 5,009,858, Cl. 422-186.190.

Ashahi Glass Company, Ltd.: *See*—
Harano, Takeshi; Takaki, Satoru; Shigesato, Yuzo; Suzuki, Koichi; Hashimoto, Naoki; Kojima, Hiroyasu; and Oyama, Takuji, 5,009,922, Cl. 427-37.000.

Ashland Oil, Inc.: *See*—
Yatsuka, Takeshi; Murata, Hiroshi; Mizumura, Yutaka; and Kotera, Nobukazu, 5,009,960, Cl. 428-423.100.

Ashlock Company: *See*—
Hirtle, Thomas W.; Cimperman, Frederick J.; and Silbermann, Klaus, 5,009,909, Cl. 426-481.000.

Ashmore, Benjamin H., Jr., to Texas Instruments Incorporated. Integrated-circuit configuration having fast local access time. 5,010,522, Cl. 365-189.070.

Astra Meditec Aktiebolag: *See*—
Soderberg, Per O., 5,009,596, Cl. 433-173.000.

AT&T Bell Laboratories: *See*—
Alferness, Rodney C.; Budrikis, Zigmantas L.; Hagelbarger, David W.; Kogelnik, Herwig W.; and Netravali, Arun N., 5,009,477, Cl. 350-96.150.
Bechtel, Linda K.; and Martin, Gary D., 5,010,554, Cl. 371-37.100.
Cooke, Paul W.; and Taylor, Geoffrey W., 5,010,374, Cl. 357-16.000.
Dodd, Courtney V.; and Munie, Gregory C., 5,009,724, Cl. 148-23.000.
Kutzavitch, Walter G.; and Rosenthal, Eugene J., 5,010,306, Cl. 330-284.000.
Wang, Robert C., 5,010,574, Cl. 381-42.000.

Atkinson, Diane: *See*—
Hawkins, William G.; Burke, Cathie J.; Roll, Daniel O.; Hartman, Pamela J.; and Atkinson, Diane, 5,010,355, Cl. 346-140.00R.

Atochem: *See*—
Colombier, Christian; and Cuer, Jean-Pierre, 5,010,158, Cl. 528-28.000.
Lescaut, Pierre L., 5,009,737, Cl. 156-264.000.
Pralus, Christian, 5,009,754, Cl. 204-82.000.

Atochem North America, Inc.: *See*—
Lindstrom, Michael J., 5,010,022, Cl. 436-123.000.

Atomic Energy of Canada Ltd.: *See*—
Chuang, Karl T.; McMonagle, James B.; Quaiattini, Robert J.; Seddon, William A.; and Clegg, David E., 5,009,872, Cl. 423-245.300.

Atsumi, Kiminori: *See*—
Sakuma, Shuji; Atsumi, Kiminori; and Fujita, Keijiro, 5,009,898, Cl. 424-618.000.

Attacher Lures: *See*—
Hoyt, Donald A., 5,009,023, Cl. 43-42.500.

Attardi, Anthony A.: *See*—
Nowak, William J.; Attardi, Anthony A.; and Costanza, Daniel W., 5,010,369, Cl. 355-273.000.

Auberger, Heinrich: *See*—
Glockler, Gerhard; Muller, Heinz; Kepplinger, Leopold W.; Matzawrakos, Panajiotis; Koch, Erwin; and Auberger, Heinrich, 5,009,397, Cl. 266-197.000.

Audi AG: *See*—
van Basshuysen, Richard; and Bauder, Armin, 5,009,200, Cl. 123-52.00M.

August Bilstein GmbH & Co. KG: *See*—
Herberg, Gerhard; Hoffmann, Hans-Jurgen; Gesenhues, Ludger; Huang, Zhen; and Hoscher, Reinhard, 5,009,450, Cl. 280-707.000.

Auld, John W.; Stringer, Brian F.; and Stringer, Brian F., to Noahe Engineering Limited. Article orientators. 5,009,305, Cl. 198-395.000.

Austad, Grover R. Quick tie device. 5,009,025, Cl. 43-44.830.

Austin, Dennis K.: *See*—
Robins, Kendall H.; Austin, Dennis K.; and Spraggs, Richard W., 5,009,163, Cl. 102-301.000.

Australian National University, The: *See*—
Ringwood, Alfred E., 5,010,043, Cl. 501-90.000.

Authement, Sherrill A., Sr. Chair lift apparatus. 5,009,284, Cl. 182-142.000.

Autoflug GmbH & Co. Fahrzeugtechnik: *See*—
Wedler, Peter; and Eckmann, Peter, 5,008,989, Cl. 24-641.000.

Auxier, David. Investment game and method of advertisement. 5,009,429, Cl. 273-240.000.

Avery, Leslie R., to David Sarnoff Research Center, Inc. Voltage stress alterable ESD protection structure. 5,010,380, Cl. 357-23.130.

Avidan, Amos A.; and Yurchak, Sergei, to Mobil Oil Corporation. Integrated catalytic reactor system with light olefin upgrading. 5,009,851, Cl. 422-141.000.

AVL Gesellschaft fuer Verbrennungs-kraftmaschinen und Messtechnik m.b.H., Prof. Dr. Dr. h.c. Hans List: *See*—
Krempl, Peter W.; Wegscheider, Guenther; and Woess, Gerhard, 5,010,302, Cl. 330-107.000.

Avon Products, Inc.: *See—*
Wilmott, James M.; Koelle, William H.; and Znaiden, Alexander P., 5,010,110, Cl. 514-758.000.

B. F. Goodrich Company, The: *See—*
Fisher, John M.; and Young, David R., 5,009,249, Cl. 137-495.000.
Lai, John T.; and Filla, Deborah S., 5,010,177, Cl. 534-586.000.
Lai, John T., 5,010,178, Cl. 534-586.000.
Lai, John T., 5,010,179, Cl. 534-586.000.
Yu, Simon H. P., 5,010,139, Cl. 525-187.000.

B&W Fuel Company: *See—*
King, Raymond A., 5,009,839, Cl. 376-352.000.

Babcock, Douglas W., to Analog Devices, Incorporated. Automatic test equipment with active load having high-speed inhibit mode switching. 5,010,297, Cl. 324-158.00R.

Babcock Industries, Inc.: *See—*
Chaczyk, Adam W.; and Baumgarten, John M., 5,009,122, Cl. 74-502.600.

Babl, Albert: *See—*
Kunz, Reiner; Babl, Albert; Zahradnicek, Ales; and Dietrich, Rainer, 5,009,674, Cl. 51-295.000.

Bachli, Emil. Heat-insulating building and/or light element. 5,009,218, Cl. 126-452.000.

Bachmann, Othmar: *See—*
Waeber, Rene; Knabenhans, Fritz; and Bachmann, Othmar, 5,008,978, Cl. 19-66.0CC.

Back, Anthony C., to John Crane U.K. Limited. Mechanical face seal including two diaphragms surrounding a gland plate. 5,009,437, Cl. 277-88.000.

Bacon, Edward R.: *See—*
Lesher, George Y., deceased; Bacon, Edward R.; Singh, Baldev; and Kuo, Gee-Hong, 5,010,086, Cl. 514-303.000.

Baer, Thomas: *See—*
Schmidt, Richard R.; Baer, Thomas; Zimmerman, Peter; and Wendel, Albrecht, 5,010,059, Cl. 514-25.000.

Bagcraft Corporation of America: *See—*
Faltynek, Mark, 5,009,518, Cl. 383-106.000.

Bahr, Edward, to Imtech International, Inc. Method and apparatus for displaying an enlarged image on multiple monitors to form a composite image. 5,010,413, Cl. 358-242.000.

Bailey, Thomas F.; Lancaster, Charles E.; and Lee, Richard, to Drilex Systems, Inc. Packer for wellhead repair unit. 5,009,265, Cl. 166-118.000.

Baker Cummins Pharmaceuticals, Inc.: *See—*
Hsiao, Charles, 5,009,894, Cl. 424-451.000.

Baker, Derrick J.; Bugden, Walter G.; and Smith, Peter R., to Lilliwyte Societe Anonyme. Joining of ceramic components to metal components. 5,009,357, Cl. 228-122.000.

Baker Hughes Incorporated: *See—*
Sliger, Kris M.; Moeller, Randolph C.; and Williamson, Scott E., 5,009,264, Cl. 166-106.000.

Bakhshi, Shiv K.: *See—*
Klett, Paul A.; Bakhshi, Shiv K.; and Stahl, Steven B., 5,009,932, Cl. 427-243.000.

Balakrishnan, Ramesh; and Boissevain, Mathew G., to Measurex Corporation. Process and system for controlling the basis weight of a sheet material. 5,009,748, Cl. 162-198.000.

Balasubramanian, Mannarsamy; and Choudhury, Pranab, to Ethyl Corporation. Process for preparing organosilazanes. 5,010,157, Cl. 528-14.000.

Baldino, Robert L., to Eastman Kodak Company. Multi-layer printed circuit board and a method for assuring assembly in a selected order. 5,010,449, Cl. 361-414.000.

Ban, Yoshiyuki: *See—*
Yamamoto, Takemi; Nagata, Osamu; Komiya, Ryohei; Sakai, Jun; and Ban, Yoshiyuki, 5,010,360, Cl. 355-20.000.

Bando Chemical Industries, Ltd.: *See—*
Yasuda, Masashi; Uchimoto, Yoshihiro; and Mikata, Yasunori, 5,009,352, Cl. 226-94.000.

Banik, Anthony, to Allied-Signal Inc. Processing nickel-base superalloy powders for improved thermomechanical working. 5,009,704, Cl. 75-238.000.

Bank, Howard M.; Cifuentes, Martin E.; and Martin, Theresa E., to Dow Corning Corporation. Process for the synthesis of soluble, condensed hydridosilicon resins containing low levels of silanol. 5,010,159, Cl. 528-23.000.

Banks, James V., to Control Fluidics, Inc. Filter system. 5,009,776, Cl. 210-108.000.

Bankstahl, Herbert A.; Forsgren, Lyle M.; Newman, Neil A.; Beck, Wayne T.; and Griffiths, John M., to Brunswick Corporation. Torque splitting drive train mechanism for a dual counterrotating propeller marine drive system. 5,009,621, Cl. 440-75.000.

Barbaro-Forleo, Marco: *See—*
Marciano-Agostinelli, Fabrizio; Barbaro-Forleo, Marco; Marin, Carlo; and Cinquemani, Paul L., 5,010,209, Cl. 174-23.00C.

Barke, Oscar A.: *See—*
Ahmad, Mohammad R.; and Barke, Oscar A., 5,009,886, Cl. 424-58.000.

Barker, Allan, to Senetics Corporation. Indicator cap for a medicine bottle. 5,009,338, Cl. 215-230.000.

Barker, Owen P. Solar harness. 5,009,243, Cl. 136-246.000.

Barlow, Wayne K.: *See—*
Stokes, Barry O.; Bradshaw, Gary D.; and Barlow, Wayne K., 5,009,185, Cl. 118-52.000.

Barmag AG: *See—*
Gehrmann, Bernd; and Treptow, Heinz, 5,008,992, Cl. 28-271.000.

Baroid Technology, Inc.: *See—*
House, Roy F.; and Hoover, Lonnie D., 5,009,798, Cl. 252-8.551.

Barrett, Clifford E., III: *See—*
Snowden, Gregory O.; Barrett, Clifford E., III; and Gomez, Fernando, 5,010,330, Cl. 340-825.210.

Barrios, Richard C.; and Hayes, Philip A., to Modern Industries, Inc. Triangular truss walkout cantilever. 5,008,967, Cl. 14-7.000.

Bartee, Edward C., to Square D Company. Flushing floor fitting. 5,010,211, Cl. 174-48.000.

Bartels, Craig R., to Texaco Inc. Separation of compositions containing water and organic oxygenates. 5,009,783, Cl. 210-500.410.

Bartholomew, Donald D., to Proprietary Technology, Inc. Swivelable quick connector assembly. 5,009,454, Cl. 285-24.000.

Bartilucci, Mark P.; Karsner, Grant G.; and Tracy, William J., III, to Mobil Oil Corporation. Recycle of oily refinery wastes. 5,009,767, Cl. 208-85.000.

Bartkowski, Klaus-Dieter; and Venn, Peter, to Gebr. Happich GmbH. Chemical method of avoiding a rainbow effect caused by the layer of oxide produced upon the brightening of parts of aluminum or aluminum alloys. 5,009,756, Cl. 204-129.350.

Barton, Russell L., to Eli Lilly and Company. Antibody-drug conjugates. 5,010,176, Cl. 530-388.000.

Bary, Daniel: *See—*
Lessi, Jacques; Perreau, Philippe; Bary, Daniel; and Grard, Guy, 5,009,512, Cl. 374-6.000.

BASF Aktiengesellschaft: *See—*
Bloemacher, Martin; Schlegel, Reinhold; and Weinand, Dieter, 5,009,841, Cl. 419-23.000.
Hahn, Klaus; Guhr, Uwe; Hintz, Hans; Wittenberg, Dietmar; and Gleich, Peter, 5,010,111, Cl. 521-56.000.
Hennig, Karl; Hartmann, Heinrich; and Raubenheimer, Hans-Juergen, 5,010,150, Cl. 526-88.000.
Hermeling, Dieter; Becker, Rainer; and Dobler, Walter, 5,009,753, Cl. 204-75.000.
Keil, Michael; Schirmer, Ulrich; Kast, Juergen; Kolassa, Dieter; Wuerzer, Bruno; Meyer, Norbert; Rademacher, Wilhelm; Jung, Johann; and Carlson, Dale R., 5,009,702, Cl. 71-100.000.
Martischius, Franz-Dieter; Vogel, Hans-Henning; Greif, Norbert; Oppenlaender, Knut; Denzinger, Walter; and Hartmann, Heinrich, 5,009,670, Cl. 44-385.000.
Perner, Johannes; Diessel, Paul; Hartmann, Heinrich; Denzinger, Walter; Oftring, Alfred; and Schoenleben, Willibald, 5,009,805, Cl. 252-174.240.
Plath, Peter; Eicken, Karl; Rueb, Lothar; Schwalge, Barbara; Westphalen, Karl-Otto; and Wuerzer, Bruno, 5,009,701, Cl. 71-96.000.
Schoettle, Klaus; Buhk, Artur; and Gliniorz, Lothar, 5,010,434, Cl. 360-132.000.
Steck, Werner; Marosi, Laszlo; Haberkorn, Herbert; Feser, Rainer; Huebner, Werner; and Jakusch, Helmut, 5,009,877, Cl. 423-607.000.

Bass, Eric. Exercise shield device, diagnostic tool. 5,009,414, Cl. 272-76.000.

Bateman, Paul M.: *See—*
Ivey, John S.; Bateman, Paul M.; Clauss, Julius A.; Cole, Edward H., Jr.; and Mott, Philip J., 5,009,631, Cl. 474-213.000.

Batesville Casket Company, Inc.: *See—*
Craft, William K., 5,008,990, Cl. 27-2.000.

Bathrick, Erwin W.; and Zmuda, James E., to Hughes Aircraft Company. Distributed information system having automatic invocation of key management negotiations protocol and method. 5,010,572, Cl. 380-21.000.

Bauder, Armin: *See—*
van Basshuysen, Richard; and Bauder, Armin, 5,009,200, Cl. 123-52.00M.

Bauer, Paul R.: *See—*
Chang, Ker-Chin; Elkins, Clarence E.; Marshall, Paul A.; Dunwoodie, Duane E.; Mansour, Mohamed M.; Bauer, Paul R.; and Lobitz, Walter A., 5,010,544, Cl. 370-13.100.

Bauer, Ralph: *See—*
Rue, Charles V.; van de Merwe, Ronald H.; Bauer, Ralph; Pellow, Scott W.; Cottringer, Thomas E.; and Klok, Richard J., 5,009,676, Cl. 51-309.000.

Baufume, Michel: *See—*
Kafka, Bernard; and Baufume, Michel, 5,009,030, Cl. 47-64.000.

Baughman, Ray H.; Buff, Ernest D.; Eckhardt, Helmut; and Fuchs, Gerhard H., to Allied-Signal Inc. Dual-pane thermal window with liquid crystal shade. 5,009,044, Cl. 52-171.000.

Baumann, Wolfgang J., to University of Minnesota, Regents of the. Phospholipase A_2-resistant liposomes. 5,009,956, Cl. 428-402.200.

Baumgarten, John M.: *See—*
Chaczyk, Adam W.; and Baumgarten, John M., 5,009,122, Cl. 74-502.600.

Baxter, Carlton J., to Eastman Kodak Company. Slide transparency projector apparatus for use with an electrophotographic reproduction machine. 5,010,366, Cl. 355-240.000.

Baxter International Inc.: *See—*
Minshall, Billy W.; Purohit, Kailash; Nygard, John E.; Sintim-Damoa, Kwame; Giesler, Richard; and Woodworth, Archie, 5,009,654, Cl. 604-410.000.
Pike, Kelly A.; and Hessel, Stephen R., 5,009,251, Cl. 137-601.000.

Bayer Aktiengesellschaft: *See—*
De Cleyn, Rene ; Thometzek, Peter; and Rademachers, Jakob, 5,009,879, Cl. 423-610.000.
Eckel, Thomas; Leitz, Edgar; Wittmann, Dieter; Ott, Karl-Heinz; Peters, Horst; and Schoeps, Jochen, 5,010,135, Cl. 525-63.000.

Henning, Rolf; Benz, Gunter; Stasch, Johannes-Peter; Knorr, Andreas; and Bender, Wolfgang, 5,010,057, Cl. 514-018.000.
Kaufmann, Dieter; and Gallenkamp, Bernd, 5,010,201, Cl. 546-316.000.
Kohler, Burkhard; and Meyer, Rolf-Volker, 5,010,169, Cl. 528-388.000.
Kramer, Wolfgang; Weissmuller, Joachim; Berg, Dieter; Brandes, Wilhelm; and Dutzmann, Stefan, 5,010,101, Cl. 514-462.000.
Kramer, Wolfgang; Jautelat, Manfred; and Kranz, Eckart, 5,010,208, Cl. 548-267.800.
Lindel, Hans; Hallenbach, Werner; Berschauer, Friedrich; Greife, Heinrich; and Klotz, Gernot, 5,010,091, Cl. 514-357.000.
Maurer, Fritz; Lantzsch, Reinhard; Fiege, Helmut; and Schnatterer, Albert, 5,010,193, Cl. 544-243.000.
Schade, Gerold; Marhold, Albrecht; and Brandes, Wilhelm, 5,010,094, Cl. 514-399.000.
Serini, Volker; Freitag, Dieter; Westeppe, Uwe; Idel, Karsten; Grigo, Ulrich; Casser, Carl; Paetz, Klaus-Christian; and Hajek, Manfred, 5,010,162, Cl. 528-196.000.
Serini, Volker; Freitag, Dieter; Westeppe, Uwe; Idel, Karsten; Grigo, Ulrich; Casser, Carl; Paetz, Klaus-Christian; and Hajek, Manfred, 5,010,163, Cl. 528-196.000.
Traubel, Harro; Strenger, Heinrich; Weber, Karl A.; Muller, Hans-Werner; Zapfel, Horst; and Hummel, Axel, 5,009,921, Cl. 427-31.000.
Wagner, Joachim; Peltzer, Karl; and Rasshofer, Werner, 5,009,950, Cl. 428-290.000.
Westeppe, Uwe; Piejko, Karl-Erwin; and Lindner, Christian, 5,010,138, Cl. 525-183.000.
Westeppe, Uwe; Weymans, Gunther; Grigo, Ulrich; Idel, Karsten-Josef; and Freitag, Dieter, 5,010,147, Cl. 525-462.000.

Bayern-Chemie Gesellschaft fuer flugchemische Antriebe mbH: *See*—
Nilsson, Karl E., 5,009,855, Cl. 422-164.000.

Beamenderfer, Robert E.: *See*—
Fogg, Michael W.; Koegel, Keith S.; Shuey, John R.; Zelko, William E.; and Beamenderfer, Robert E., 5,009,614, Cl. 439-497.000.

Beasom, James D., to Harris Corporation. Isolated gate MESFET and method of trimming. 5,010,377, Cl. 357-22.000.

Beattie, David C.: *See*—
Wortley, Ronald W.; and Beattie, David C., 5,009,636, Cl. 604-43.000.

Beattie, Patrick J.; Oliveri, Andrew L.; and Sylvester, Richard J., to John D. Brush & Co., Inc. Combination lock assembly. 5,009,090, Cl. 70-326.000.

Beauch, Howard D.: *See*—
Iseler, Stanley J.; Beauch, Howard D.; Everett, Benjamin H., II; and Sutorik, John P., 5,009,120, Cl. 74-493.000.

Beaurepaire, Olivier; and Thompson, Frederick H., to AE PLC. Wrist pin. 5,009,124, Cl. 74-595.000.

Bechtel, Linda K.; and Martin, Gary D., to AT&T Bell Laboratories. Error correction method and apparatus. 5,010,554, Cl. 371-37.100.

Beck, Boyd R.; and Harris, Robert D., to Harris Research Inc. Composition and method for providing stain resistance to polyamide fibers using carbonated solutions. 5,009,667, Cl. 8-115.560.

Beck, Terry E.: *See*—
Montgomery, Gary V.; and Beck, Terry E., 5,009,323, Cl. 215-252.000.

Beck, Wayne T.: *See*—
Bankstahl, Herbert A.; Forsgren, Lyle M.; Newman, Neil A.; Beck, Wayne T.; and Griffiths, John M., 5,009,621, Cl. 440-75.000.

Becker, John W., to Akzo N.V. Multi-fractionable tablet structure. 5,009,896, Cl. 424-467.000.

Becker, Rainer: *See*—
Hermeling, Dieter; Becker, Rainer; and Dobler, Walter, 5,009,753, Cl. 204-75.000.

Becker, Wilfried: *See*—
Sippel, Achim; Kruse, Heinz-Josef; and Becker, Wilfried, 5,009,167, Cl. 102-524.000.

Beecham Pharmaceuticals: *See*—
Markwell, Roger E.; Smith, Stephen A.; Hughes, Ian; and Gaster, Laramie M., 5,010,097, Cl. 514-419.000.

Beissel, Dieter: *See*—
Walch, Axel; Wildhardt, Juergen; and Beissel, Dieter, 5,009,824, Cl. 264-45.100.

Belardinelli, Luiz: *See*—
Feldman, Marc D.; Skalak, Thomas C.; and Belardinelli, Luiz, 5,009,634, Cl. 604-27.000.

Bell Communications Research, Inc.: *See*—
Gimlett, James L., 5,010,588, Cl. 455-619.000.

Bell, Craig J., to Smiths Industries Medical Systems, Inc. Blood containment device. 5,009,850, Cl. 422-99.000.

Bell, George S. Wave actuated power generating apparatus. 5,009,568, Cl. 415-3.100.

Bell, John A.: *See*—
Hamilton, Michael C.; and Bell, John A., 5,010,346, Cl. 341-137.000.

Bell-TRH Limited: *See*—
Burley, Noel A., 5,010,316, Cl. 338-238.000.

Bell, William E.; and McNerney, John J., to Arizona Instrument Corp. Method for restoring the sensing capacity of an electrical sensor. 5,010,021, Cl. 436-120.000.

Beloit Corporation: *See*—
LeBlanc, Peter E., 5,009,774, Cl. 209-273.000.

Bender, Wolfgang: *See*—
Henning, Rolf; Benz, Gunter; Stasch, Johannes-Peter; Knorr, Andreas; and Bender, Wolfgang, 5,010,057, Cl. 514-018.000.

Bengt Henningson: *See*—
Hermanson, Fredrik, 5,009,381, Cl. 248-221.100.

Benin, Joshua; Di Maio, William G.; Morin, Carl F.; and Lawler, James A., to Du Pont de Nemours, E. I., and Company. Vortexing liquid container. 5,009,942, Cl. 428-36.600.

Bennett, Ronald, to Ultra Creative Corp. Plastic film bag with a multi-layered bight through which a hanger extends and related methods. 5,009,515, Cl. 383-23.000.

Bennington, Thomas E. Flight simulator apparatus using an inoperative aircraft. 5,009,598, Cl. 434-30.000.

Benson, Stephen V.: *See*—
Madey, John M. J.; Benson, Stephen V.; Schultz, John F.; and Cutolo, Antonello, 5,010,555, Cl. 372-2.000.

Benson, Werner: *See*—
Waldeck, Harald; Benson, Werner; Zeugner, Horst; Wolf, Klaus-Ullrich; Gregory, Peter-Colin; Hamminga, Derk; and van Wijngaarden, Ineke, 5,010,076, Cl. 514-221.000.

Benz, Gunter: *See*—
Henning, Rolf; Benz, Gunter; Stasch, Johannes-Peter; Knorr, Andreas; and Bender, Wolfgang, 5,010,057, Cl. 514-018.000.

Berendt, Hans-Ulrich; and Topfl, Rosemarie, to Ciba-Geigy Corporation. Mixture of assistants and its use in the dyeing of synthetic fibre materials: acid ester of oxyalkylated phendi, nonionic surfactant and dye carrier. 5,009,668, Cl. 8-557.000.

Berendt, Hans-Ulrich: *See*—
Jollenbeck, Martin; Berendt, Hans-Ulrich; and Fringeli, Werner, 5,009,669, Cl. 8-573.000.

Berg, Dieter: *See*—
Kramer, Wolfgang; Weissmuller, Joachim; Berg, Dieter; Brandes, Wilhelm; and Dutzmann, Stefan, 5,010,101, Cl. 514-462.000.

Berger, Paul L.: *See*—
Berger, Richard C.; and Berger, Paul L., 5,009,386, Cl. 248-613.000.

Berger, Richard C.; and Berger, Paul L. Pipe hanger and support. 5,009,386, Cl. 248-613.000.

Bergman, James F.: *See*—
Holtan, Ramer B., Jr.; Falk, Kevin L.; Bergman, James F.; Smith, James R.; and Nelson, Kenneth E., 5,009,496, Cl. 351-156.000.

Bergsten, Curt A. Article cassette for a vending machine. 5,009,328, Cl. 221-152.000.

Berling, Steven J.: *See*—
Lawrence, Ronald L.; and Miller, Mark R., 5,009,342, Cl. 222-136.000.

Bernardin, Leo J., to Kimberly-Clark Corporation. Absorbent structure designed for absorbing body fluids. 5,009,650, Cl. 604-378.000.

Bernstein, Lawrence J., to Eastman Kodak Company. Method and apparatus for signal companding. 5,010,410, Cl. 358-214.000.

Bernstrom, Marvin L., to Eaton Corporation. Rotary fluid pressure device and improved stationary valve plate therefor. 5,009,582, Cl. 418-61.300.

Berry, David H.: *See*—
McManus, Michael J.; Berry, David H.; and Dover, Harold P., 5,009,947, Cl. 428-122.000.

Berschauer, Friedrich: *See*—
Lindel, Hans; Hallenbach, Werner; Berschauer, Friedrich; Greife, Heinrich; and Klotz, Gernot, 5,010,091, Cl. 514-357.000.

Betz Laboratories, Inc.: *See*—
Donofrio, Deborah K.; and Whitekettle, Wilson K., 5,010,066, Cl. 514-75.000.

Bewsey, John A., to Harvest Chemicals (Proprietary) Limited. Alginate composition for application to a soil or plant locus. 5,009,710, Cl. 106-208.000.

Bianco, Armandodariano: *See*—
Antonaroli, Simonetta; Bianco, Armandodariano; Brufani, Mario; Lo Baido, Giuseppe; and Rende, Giorgio, 5,010,204, Cl. 548-128.000.

Biasillo, Alberto; and Taylor, Richard C., to International Business Machines Corp. Automated system for machining parts to close tolerances. 5,010,491, Cl. 364-474.280.

Bickle, Wolfgang: *See*—
Wullenweber, Heinz; Kohl, Peter; Jung, Herbert; Borchardt, Jurgen; Bickle, Wolfgang; and Braus, Jurgen, 5,010,050, Cl. 502-301.000.

Bieganski, Zdzislaw. Cable stripper. 5,009,005, Cl. 30-90.600.

Bieganski, Zdzislaw. Coaxial cable stripper. 5,009,130, Cl. 81-9.400.

Biftu, Tesfaye; Chabala, John C.; Bugianesi, Robert L.; Ponpipom, Mitree M.; and Sahoo, Soumya P., to Merck & Co. Inc. Certain 2,5-diaryl tetrahydrofurans and analogs thereof as PAF antagonists. 5,010,100, Cl. 514-461.000.

Bigari, Steven T., to JBH Ventures. Apparatus, system and method for creating credit vouchers usable at point of purchase stations. 5,010,485, Cl. 364-408.000.

Bikson, Benjamin; Nelson, Joyce K.; and Perrin, Jerry E., to Union Carbide Industrial Gases Technology Corporation. Process for recovery of ammonia from an ammonia-containing gas mixture. 5,009,678, Cl. 55-16.000.

Bilsbury, Stephen J.; Dennis, William G., Jr.; and Kernosky, Stephen K., to Olin Corporation. Low cost penetrator projectile. 5,009,166, Cl. 102-516.000.

Bimbi, Domenico. Automotive parts support rack. 5,009,337, Cl. 211-86.000.

Binet, Jean: *See*—
Manoury, Philippe; Binet, Jean; Obitz, Daniel; Defosse, Gerard; Dewitte, Elisabeth; and Veronique, Corinne, 5,010,079, Cl. 514-253.000.

Bing-huang, Que: *See*—
Pei-gi, Mao; Jing, Gan; and Bing-huang, Que, 5,009,388, Cl. 251-65.000.
Bio-Plexus, Inc.: *See*—
Sahi, Carl R., 5,009,642, Cl. 604-158.000.
Biomeasure, Inc.: *See*—
Kim, Sun H.; and Moreau, Sylviane, 5,010,089, Cl. 514-314.000.
Birch, Phillip J.: *See*—
Hayes, Ann G.; and Birch, Phillip J., 5,010,096, Cl. 514-411.000.
Bishai, Macram N., to McCord Winn Textron Inc. Port fuel injection and induction system for internal combustion engine. 5,009,212, Cl. 123-533.000.
Bittler, Dieter; Laurent, Henry; Rach, Petra; and Topert, Michael, to Schering Aktiengesellschaft. Androstane derivatives. 5,010,071, Cl. 514-178.000.
Black, Robert H.; and Venaleck, John T., to Ohio Associated Enterprises, Inc. Method and apparatus for making electrical connecting device. 5,009,618, Cl. 439-736.000.
Blackburn, Bruce N., to Weinstein, Bernard. Dial face for clock or watch. 5,010,533, Cl. 368-223.000.
Blaney, Carol A.: *See*—
Hossain, Shafi U.; and Blaney, Carol A., 5,009,745, Cl. 162-5.000.
Hossain, Shafi U.; and Blaney, Carol A., 5,009,746, Cl. 162-5.000.
Blaschek, Otto. Sound insulated interchangeable iens. 5,009,499, Cl. 352-35.000.
Blazek, Vladimir: *See*—
Schmitt, Hans J.; and Blazek, Vladimir, 5,009,231, Cl. 128-633.000.
Bloemacher, Martin; Schlegel, Reinhold; and Weinand, Dieter, to BASF Aktiengesellschaft. Process for dewaxing injection molded metal pieces and for improving the properties thereof. 5,009,841, Cl. 419-23.000.
Blount, David H. Flame-retardant polyurethane products. 5,010,113, Cl. 521-107.000.
Board of Regents, The University of Texas System: *See*—
Serwer, Philip; and Griess, Gary A., 5,009,759, Cl. 204-182.800.
Board of Trustees operating Michigan State University: *See*—
Ries, Stanley K.; Wert, Violet F.; and Nair, Muraleedharan G., 5,009,698, Cl. 71-92.000.
Bobry, Howard H., to Albar. Uninterruptible power supply with dual level voltage input. 5,010,469, Cl. 363-37.000.
Bock, Georg: *See*—
John, Thomas; and Bock, Georg, 5,009,158, Cl. 101-219.000.
Bocskor, Steven: *See*—
Giangano, David A.; Kesselman, Martin; Bocskor, Steven; and Celona, Anthony R., 5,010,339, Cl. 341-164.000.
Boden, Karl; Ibach, Harald; and Linke, Udo, to Kernforschungsanlage Julich GmbH. Bar and crucible magnetic suspension for a crystal-growing apparatus. 5,009,865, Cl. 422-249.000.
Bodkins, Stanley H., to Gillette Company, The. Anti-pilferage fixture. 5,009,334, Cl. 211-54.100.
Boehringer Mannheim Corp.: *See*—
Serbousek, Jon C.; and Engelhardt, John A., 5,009,665, Cl. 623-22.000.
Vrabel, William S., 5,009,225, Cl. 128-201.240.
Boeing Company, The: *See*—
Falk, R. A.; Capps, C. D.; and Houk, T. L., 5,010,505, Cl. 364-713.000.
Garriss, Gregory M., 5,010,412, Cl. 358-240.000.
Hamilton, Michael C.; and Bell, John A., 5,010,346, Cl. 341-137.000.
Boes, Rudolph. Twine feeding apparatus for round hay balers. 5,009,154, Cl. 100-5.000.
Boghen, Franklin M.; Camanni, Franco; Del Soldato, Piero; Ghigo, Ezio; and Muller, Eugenio, to Pierrel SpA. Pharmaceutical composition for intranasal administration, comprising GH-releasing hormone, a cholinergic agonist and optionally a bile salt. 5,010,056, Cl. 514-12.000.
Boissevain, Mathew G.: *See*—
Balakrishnan, Ramesh; and Boissevain, Mathew G., 5,009,748, Cl. 162-198.000.
Boissonneault, Roger M., to Warner-Lambert Company. Graduated estrogen contraceptive. 5,010,070, Cl. 514-171.000.
Bolan, Michael L.: *See*—
Dias, Donald R.; Lee, Robert D.; Bolan, Michael L.; and Scherpenberg, Francis A., 5,010,331, Cl. 340-825.310.
Bolte, Georg, to Schmalbach-Lubeca AG. Easy-open package for fluent material. 5,009,364, Cl. 229-123.200.
Bolton, Barbara A.: *See*—
Wells, Gregory J.; and Bolton, Barbara A., 5,009,099, Cl. 73-1.00G.
Bonnand, Christian; Mascart, Dominique; and Druelle, Philippe, to Stein Industrie; and Electricte de France. Machine for remotely lining the inside of a heat exchanger tube end with a sleeve. 5,008,996, Cl. 29-727.000.
Bonnell, Raymond J., to Vickers, Incorporated. Power transmission. 5,009,067, Cl. 60-484.000.
Bopp, Lawrence H., to General Electric Company. Method for biodegrading PCBs. 5,009,999, Cl. 435-29.000.
Borchardt, Jurgen: *See*—
Wullenweber, Heinz; Kohl, Peter; Jung, Herbert; Borchardt, Jurgen; Bickle, Wolfgang; and Braus, Jurgen, 5,010,050, Cl. 502-301.000.
Borg-Warner Automotive, Inc.: *See*—
Ivey, John S.; Bateman, Paul M.; Clauss, Julius A.; Cole, Edward H., Jr.; and Mott, Philip J., 5,009,631, Cl. 474-213.000.
Borst, Gerhard, executor: *See*—
Fischer, Karl; Borst, Gerhard, executor; Treffinger, Heinz, executor; and Fischer, Dorothee, executrix, 5,010,235, Cl. 219-455.000.
Bost S.A.: *See*—
Dessirier, Charles, 5,009,557, Cl. 411-504.000.
Bostad, Wayne W.: *See*—
Ruder, Carl J.; Haney, Ronald J.; Chutorash, Richard J.; Bostad, Wayne W.; Zweig, Arnold A.; and Payne, Lyle B., 5,009,560, Cl. 414-392.000.
Bottom, Carey B.; and Kwoka, Margaret N., to Marion Laboratories, Inc. Stable liquid form of 5-aminosalicylic acid. 5,010,069, Cl. 514-166.000.
Boudon, Gerard; Mollier, Pierre; Nuez, Jean-Paul; Ong, Ieng; Tannhof, Pascal; and Wallart, Franck, to International Business Machines Corporation. BICMOS logic circuit with full swing operation. 5,010,257, Cl. 307-446.000.
Bournonville, Jean-Paul: *See*—
Petit, Laurent; Bournonville, Jean-Paul; Guth, Jean-Louis; Raatz, Francis; and Seive, Alain, 5,010,048, Cl. 502-61.000.
Bourque, Douglas A.: *See*—
Gilberto, Daniel G., 5,009,132, Cl. 81-57.300.
Bovenkamp, John W.: *See*—
Thoraval, Dominique; and Bovenkamp, John W., 5,009,845, Cl. 422-56.000.
Bowers, Thomas R.: *See*—
Allen, Bert L.; Gwozdz, Peter S.; and Bowers, Thomas R., 5,010,024, Cl. 437-24.000.
Bowman, James: *See*—
Ptaschek, Lawrence; Bowman, James; and Ferguson, H. William, Jr., 5,009,058, Cl. 53-469.000.
Braatz, Paul O.: *See*—
Grinberg, Jan; Welkowsky, Murray S.; Wu, Chiung-Sheng; and Braatz, Paul O., 5,010,251, Cl. 250-332.000.
Bradley, Gary W.: *See*—
Arrington, Stephen T.; and Bradley, Gary W., 5,009,714, Cl. 134-2.000.
Bradshaw, Gary D.: *See*—
Stokes, Barry O.; Bradshaw, Gary D.; and Barlow, Wayne K., 5,009,185, Cl. 118-52.000.
Brady, Peter J., to Square D Company. Plug-in transient voltage suppressor module. 5,010,438, Cl. 361-56.000.
Brady, Richard L.: *See*—
deFigueiredo, Mario P.; and Brady, Richard L., 5,009,903, Cl. 426-243.000.
Brady, Thomas E.; Condon, Michael E.; and Marc, Pierre A., to American Cyanamid Company. 1-{[O-(cyclopropylcarbonyl)phenyl]sulfamoyl}-3-(4,6-dimethoxy-2-pyrimidinyl)urea herbicidal composition and use. 5,009,699, Cl. 71-92.000.
Braestrup, Claus: *See*—
Gronvald, Frederik C.; and Braestrup, Claus, 5,010,090, Cl. 514-326.000.
Braestrup, Claus T.; Nielsen, Mogens C.; Christensen, Joergen A.; Engelstoft, Mogens; Schou, Henning; Eder, Ulrich; Néef, Gunter; Huth, Andreas; Rahtz, Dieter; and Schmiechen, Ralph, to A/S Ferrosan; and Schering Aktiengesellschaft. β-carbolin-3-carboxylic acid derivatives useful for treating anxiety and related disorders. 5,010,077, Cl. 514-228.800.
Braglia, Marco; DeFranceschi, Roberto; and Montangero, Paolo, to SIP - Societa Italiana per l'Esercizio Delle Telecomunicazioni P.A. Detection system for cathodoluminescence analysis. 5,010,253, Cl. 250-399.000.
Brake, Anthony J.; and Van Den Berg, Johan A., to Chiron Corporation; and Gist-Brocades NV. DNA constructs containing a Kluyveromyces alpha factor leader sequence for directing secretion of heterologous polypeptides. 5,010,182, Cl. 536-27.000.
Branam, Timothy R.; Roberts, Jeffrey J.; and Schoenberger, Jack O., to Westinghouse Electric Corporation. Method and apparatus for monitoring and measuring dynamic loads in thrust inducing systems. 5,009,101, Cl. 73-168.000.
Brandes, Wilhelm: *See*—
Kramer, Wolfgang; Weissmuller, Joachim; Berg, Dieter; Brandes, Wilhelm; and Dutzmann, Stefan, 5,010,101, Cl. 514-462.000.
Schade, Gerold; Marhold, Albrecht; and Brandes, Wilhelm, 5,010,094, Cl. 514-399.000.
Brandolese, Ernesto, to Agip Petroli S.p.A. Lubricant fluid for the cold-rolling of steel. 5,009,803, Cl. 252-49.500.
Brangle, Edward J., Jr. Quick-assembled folding carton with reinforced bottom that locks in position. 5,009,362, Cl. 229-117.000.
Braun, Anthony E.: *See*—
Jons, Roena B., 5,009,054, Cl. 53-397.000.
Braun, Jeffrey J., to Motorola, Inc. Balanced integrated circuit differential amplifier. 5,010,303, Cl. 330-257.000.
Braus, Jurgen: *See*—
Wullenweber, Heinz; Kohl, Peter; Jung, Herbert; Borchardt, Jurgen; Bickle, Wolfgang; and Braus, Jurgen, 5,010,050, Cl. 502-301.000.
Brava Patient Och Invent AB: *See*—
Broome, Albert, 5,009,663, Cl. 606-232.000.
Brazell, David O.; and French, J. Timothy, to Superior Fireplace Company. Adjustable lintel extension for a fireplace. 5,009,221, Cl. 126-538.000.
Breeding, Kenneth E.: *See*—
Pruett, Wayne P.; Meyer, Max F., Jr.; and Breeding, Kenneth E., 5,010,165, Cl. 528-272.000.
Brekke, Kristian, to Aker Engineering a.s. Method and a system for separating and transporting gas and liquid. 5,009,680, Cl. 55-40.000.

Bremel, Robert D.: *See—*
Schuler, Linda A.; Gorski, Jack; Hurley, Walter L.; Bremel, Robert D.; and Rottman, Fritz M., 5,010,011, Cl. 435-252.300.

Brennesholtz, Matthew S., to North American Philips Corporation. Method for forming a deposited layer on a skirted substrate. 5,009,930, Cl. 427-236.000.

Bretthauer, Hans-Jurgen: *See—*
Focke, Heinz; and Bretthauer, Hans-Jurgen, 5,009,741, Cl. 156-483.000.

Bricker, Mark: *See—*
Spitz, Robert A.; and Bricker, Mark, 5,009,868, Cl. 423-139.000.

Bridgestone Corporation: *See—*
Ikeda, Kazunari; and Sanada, Koichi, 5,009,732, Cl. 156-177.000.
Yamagishi, Hisashi; Kakiuchi, Shinichi; and Tomita, Seisuke, 5,009,428, Cl. 273-232.000.

Bridgestone/Firestone, Inc.: *See—*
Weitzenhof, David A., 5,009,401, Cl. 267-64.210.

Briggs & Stratton Corporation: *See—*
Fiorenza, John A., II, 5,009,208, Cl. 123-335.000.

Brinker, Dale R.; and Reiland, Thomas L., to Abbott Laboratories. Pharmaceutical granules and tablets made therefrom. 5,009,897, Cl. 424-469.000.

Bristol-Myers Company: *See—*
Sit, Sing-Yuen; and Wright, John J., 5,010,205, Cl. 548-253.000.

British Aerospace Public Limited Company: *See—*
Malvern, Alan R., 5,009,505, Cl. 356-352.000.

British Broadcasting Corporation: *See—*
Croll, Michael G., 5,010,392, Cl. 358-21.00R.

British Nuclear Fuels plc: *See—*
Hodgson, Graham, 5,009,817, Cl. 264-0.500.

British Telecommunications public limited company: *See—*
Hill, Alan M., 5,010,543, Cl. 370-3.000.
Mortimore, David B.; and Payne, David B., 5,010,586, Cl. 455-605.000.

Brockmuller, Uwe; and Weber, Hans-Gerd, to SKF GmbH. Roller seating. 5,009,525, Cl. 384-576.000.

Brooks, Kenneth J.: *See—*
Cross, David E.; Brooks, Kenneth J.; and Whiteside, Neil A., 5,009,647, Cl. 604-332.000.

Broome, Albert, to Brava Patient Och Invent AB. Method for performing a surgical closure of a skin incision or wound and means for carrying out the method. 5,009,663, Cl. 606-232.000.

Brother Kogyo Kabushiki Kaisha: *See—*
Kameyama, Fumio; and Hattori, Chikamasa, 5,009,554, Cl. 409-231.000.
Kuzuya, Susumu; Shimizu, Seiji; Kato, Mikio; Ishikawa, Yujiro; Sakai, Takashi; and Yuki, Eiji, 5,009,530, Cl. 400-188.000.
Suzuki, Makoto, 5,010,415, Cl. 358-302.000.
Yamamoto, Takemi; Nagata, Osamu; Komiya, Ryohei; Sakai, Jun; and Ban, Yoshiyuki, 5,010,360, Cl. 355-20.000.

Brothers, William S. Urine collection system. 5,009,236, Cl. 128-761.000.

Broussard, Paul C., Sr. Liquid-to-liquid oil absorption method. 5,009,787, Cl. 210-634.000.

Brown, Alan R.: *See—*
Welch, Richard M.; Brown, Alan R.; and Phillips, Arthur P., 5,010,088, Cl. 514-312.000.

Brown, Dale G.; Siddens, Jack K.; Diehl, Robert E.; and Wright, Donald P., Jr., to American Cyanamid Company. Arylpyrrole insecticidal acaricidal and nematicidal agents and methods for the preparation thereof. 5,010,098, Cl. 514-426.000.

Brown, Sterling B.: *See—*
Phanstiel, Ott, IV; and Brown, Sterling B., 5,010,144, Cl. 525-397.000.

Broxton, Peter A., to Loncraine Broxton & Partners Limited. Decorative condiment shakers. 5,009,341, Cl. 222-130.000.

Bruck, Robert: *See—*
Kalotay, Paul; Bruck, Robert; Emch, Arnold; and Martella, Donald, 5,009,109, Cl. 73-861.380.

Brufani, Mario: *See—*
Antonaroli, Simonetta; Bianco, Armandodariano; Brufani, Mario; Lo Baido, Giuseppe; and Rende, Giorgio, 5,010,204, Cl. 548-128.000.

Brumm, Phillip J., to Enzyme Bio-Systems Ltd. Stable liquid enzyme concentrate and process for its production. 5,010,008, Cl. 435-202.000.

Brunner, Gerald. Apparatus to fill seed/fertilizer drills. 5,009,254, Cl. 141-35.000.

Brunson, Welton K.: *See—*
Hubbard, Vance M.; and Brunson, Welton K., 5,008,961, Cl. 2-195.000.

Brunswick Corporation: *See—*
Bankstahl, Herbert A.; Forsgren, Lyle M.; Newman, Neil A.; Beck, Wayne T.; and Griffiths, John M., 5,009,621, Cl. 440-75.000.
Cleary, Terrance M.; Donahue, Raymond J.; Hesterberg, William G.; and Toriello, Lawrence I., 5,009,260, Cl. 164-255.000.

Bucek, Pavel: *See—*
Pajgrt, Jan; Smetak, Vincenc; Kalina, Jaroslav; Zemek, Michal; Pus, Milan; and Bucek, Pavel, 5,009,253, Cl. 139-116.200.

Buchanan, Max F.: *See—*
Sullivan, Robert W.; Holder, Tommie J.; and Buchanan, Max F., 5,009,198, Cl. 123-43.00A.

Buchegger, Rudolf, to Voest-Alpine Industrieanlagenbau GmbH. Coiler arrangement. 5,009,092, Cl. 72-148.000.

Buchkremer, Hans-Peter: *See—*
Stover, Detlev; Buchkremer, Hans-Peter; and Hecker, Rudolf, 5,009,359, Cl. 228-175.000.

Buckley, William P.: *See—*
Villeneuve, Marc G.; and Buckley, William P., 5,009,606, Cl. 439-59.000.

Budrikis, Zigmantas L.: *See—*
Alferness, Rodney C.; Budrikis, Zigmantas L.; Hagelbarger, David W.; Kogelnik, Herwig W.; and Netravali, Arun N., 5,009,477, Cl. 350-96.150.

Buff, Ernest D.: *See—*
Baughman, Ray H.; Buff, Ernest D.; Eckhardt, Helmut; and Fuchs, Gerhard H., 5,009,044, Cl. 52-171.000.

Bugden, Walter G.: *See—*
Baker, Derrick J.; Bugden, Walter G.; and Smith, Peter R., 5,009,357, Cl. 228-122.000.

Buggs, Ralph N.: *See—*
Syrinek, Allen R.; Buggs, Ralph N.; and Gabel, Robert K., 5,009,799, Cl. 252-8.553.

Bugianesi, Robert L.: *See—*
Biftu, Tesfaye; Chabala, John C.; Bugianesi, Robert L.; Ponpipom, Mitree M.; and Sahoo, Soumya P., 5,010,100, Cl. 514-461.000.

Buhk, Artur: *See—*
Schoettle, Klaus; Buhk, Artur; and Gliniorz, Lothar, 5,010,434, Cl. 360-132.000.

Bullock, James F.: *See—*
Mowforth, Clive W.; Bullock, James F.; Maternaghan, Trevor J.; and Harvey, Karen N., 5,009,991, Cl. 430-567.000.

Bunshah, Rointan F.; Parsons, James D.; and Stafsudd, Oscar M., to University of California, The Regents of the. Wafer base for silicon carbide semiconductor device. 5,010,035, Cl. 437-100.000.

Bunya, Shinichi: *See—*
Matsubara, Shinichi; Uehara, Masafumi; Bunya, Shinichi; and Katahashi, Eriko, 5,009,981, Cl. 430-175.000.

Burgener, Larry L.; and Durbin, Larry L., to Honeywell Inc. Mounting arrangement for avionics equipment. 5,009,385, Cl. 248-346.000.

Burgess, Arnold C.: *See—*
Hilbish, Brian K.; Leonard, David W., Sr.; Burgess, Arnold C.; and Burns, David R., 5,009,550, Cl. 406-87.000.

Burin, Ralph R.: *See—*
Kruck, Richard W.; Cur, Omer N.; Leclear, Douglas D.; Kuehl, Steven J.; and Burin, Ralph R., 5,009,081, Cl. 62-264.000.

Burke, Cathie J.: *See—*
Hawkins, William G.; Burke, Cathie J.; Roll, Daniel O.; Hartman, Pamela J.; and Atkinson, Diane, 5,010,355, Cl. 346-140.00R.

Burley, Noel A., to Bell-TRH Limited. Thermocouples of enhanced stability. 5,010,316, Cl. 338-238.000.

Burlison, Gary L. Axe head mounted handle protector. 5,009,010, Cl. 30-308.100.

Burman, Barry A. Animal deterrent apparatus. 5,009,192, Cl. 119-29.000.

Burndy Corporation: *See—*
Villeneuve, Marc G.; and Buckley, William P., 5,009,606, Cl. 439-59.000.

Burns, David R.: *See—*
Hilbish, Brian K.; Leonard, David W., Sr.; Burgess, Arnold C.; and Burns, David R., 5,009,550, Cl. 406-87.000.

Burres, Neal S.: *See—*
Gunasekera, Malika; Gunasekera, Sarath P.; Longley, Ross E.; and Burres, Neal S., 5,010,099, Cl. 514-459.000.

Burroughs Wellcome Co.: *See—*
Welch, Richard M.; Brown, Alan R.; and Phillips, Arthur P., 5,010,088, Cl. 514-312.000.

Busch, John P., to Dell Corporate Services Corporation. Digital apparatus having a display section adjusted by a hinge assembly with rolling resistance. 5,008,976, Cl. 16-276.000.

Buss, Erich: *See—*
Rettig, Helmut; Weiss, Karl; and Buss, Erich, 5,008,994, Cl. 29-235.000.

Bustamante, Michael R.; Renaker, John J., Jr.; and Magley, Donald A., to Damcosur S.A. De C.V. Method for absorbing liquids using dealginate kelp. 5,009,790, Cl. 210-689.000.

Butkus, Anthony K.; and Martin, Scott D., to Norton Company. Chromia-magnesia refractory body. 5,010,046, Cl. 501-117.000.

Butler, Robert: *See—*
Sindeband, Seymour J.; and Butler, Robert, 5,009,277, Cl. 178-18.000.

Butler, Ronnie T., to Peace River Arms & Accessories, Inc. Sling mountable pouch for firearms. 5,009,346, Cl. 224-205.000.

Butterworth, Mark M., to Hewlett-Packard Company. Sensor array and illumination system for a large depth-of-field bar code scanner. 5,010,241, Cl. 235-462.000.

Buxton, Galina P.; and Tang, Kuo-Chang, to Olin Hunt Specialty Products Inc. Electrostatographic particulate toner and developer compositions. 5,009,979, Cl. 430-110.000.

Bykhovsky, David G.; and Panov, Alexandr N. Device for transfer of molten metal. 5,009,399, Cl. 266-237.000

Byrne, William J., to Arthur Guinness Son & Company (Dublin) Limited. Method of packaging a beverage and a beverage package. 5,009,901, Cl. 426-112.000.

C. R. Bard, Inc.: *See—*
Daignautl, Kenneth J., Jr.; McNamara, Edward I.; and Sinofsky, Edward L., 5,009,655, Cl. 606-007.000.

Cabinnovent ApS: *See—*
Andersen, Niels J., 5,009,150, Cl. 99-360.000.

Cable/Home Communication Corporation: *See—*
Katznelson, Ron D., 5,010,571, Cl. 380-4.000.

California Institute of Technology: *See—*
Lin, True-Lon; Fathauer, Robert W.; and Grunthaner, Paula J., 5,010,037, Cl. 437-200.000.

Calviello, Joseph A.; and Hickman, Grayce A., to Eaton Corporation. Low temperature semiconductor bonding process with chemical vapor reaction. 5,010,036, Cl. 437-173.000.

Camanni, Franco: *See—*
Boghen, Franklin M.; Camanni, Franco; Del Soldato, Piero; Ghigo, Ezio; and Muller, Eugenio, 5,010,056, Cl. 514-12.000.

Campbell, Gordon C.: *See—*
Martinez, David M.; and Campbell, Gordon C., 5,009,012, Cl. 30-394.000.

Campbell, John R.: *See—*
Evans, Thomas L.; Wasserman, Carol B.; Shea, Timothy J.; and Campbell, John R., 5,010,143, Cl. 525-394.000.

Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence: *See—*
Thoraval, Dominique; and Bovenkamp, John W., 5,009,845, Cl. 422-56.000.

Canada, Her Majesty the Queen in Right of Canada as represented by the National Research Council of: *See—*
Ergan, Francoise; Trani, Michael; and Andre, Gerald, 5,010,006, Cl. 435-177.000.

Canadian Occidental Petroleum Ltd.: *See—*
Schramm, Laurier L.; and Smith, Russell G., 5,009,773, Cl. 208-391.000.

Canadian Patents and Development Limited/Societe Canadienne des Brevets et d'Exploitation Limitee: *See—*
Dobrowolski, Jerzy A.; Ho, Fang C.; and Waldorf, Allan J., 5,009,486, Cl. 350-164.000.

Canon Kabushiki Kaisha: *See—*
Araya, Junji; Ohzeki, Yukihiro; Miyamoto, Toshio; Hiroshima, Koichi; Sato, Yasushi; and Nakahata, Kimio, 5,010,370, Cl. 355-274.000.
Echizen, Hiroshi; and Takaki, Satoshi, 5,010,276, Cl. 315-111.210.
Enari, Masahiko; Shikichi, Satoshi; Kawaguchi, Fumiaki; Suzuki, Kenichi; Usui, Masayuki; Matsuoka, Hiroshi; Matsuoka, Kazuhiko; Hosoya, Hideki; Aoki, Akio; and Minoura, Kazuo, 5,010,534, Cl. 369-32.000.
Hamano, Hiroyuki, 5,009,492, Cl. 350-427.000.
Hasegawa, Masahide; Otokawa, Mitsuhiro; Matsuoka, Hidetoshi; and Hirata, Noritsugu, 5,010,424, Cl. 360-77.140.
Honda, Mitsuru; Koike, Atsushi; Kimura, Tomohiro; Ogawa, Kyosuke; and Murai, Keiichi, 5,009,974, Cl. 430-69.000.
Kinoshita, Takao; Tojo, Akihiko; Takayama, Tsutomu; Kaji, Toshio; and Tanaka, Nobuyoshi, 5,010,418, Cl. 358-335.000.
Mihara, Chieko; Santoh, Tsuyoshi; Sugata, Hiroyuki; and Fukui, Tetsuro, 5,009,987, Cl. 430-495.000.
Sakaegi, Yuji; and Fukushima, Nobuo, 5,010,423, Cl. 360-77.060.
Shibazaki, Nobuo, 5,010,496, Cl. 364-519.000.
Shimokoriyama, Makoto; and Yagisawa, Toshihiro, 5,010,391, Cl. 358-14.000.
Takeuchi, Tatsuo; and Amemiya, Koji, 5,009,945, Cl. 428-76.000.
Tokunaga, Hiroyuki; Yamagata, Kenji; and Yonehara, Takao, 5,010,033, Cl. 437-83.000.
Ueda, Shigeru, 5,010,513, Cl. 364-900.000.
Yasumura, Hiroto; Hirasawa, Masahide; Noji, Minoru; Kozuki, Susumu; Takahashi, Koji; and Yoshimura, Katsuji, 5,010,416, Cl. 358-314.000.
Yoshida, Satoshi; Nakahara, Toshiaki; Tanikawa, Hirohide; and Sakashita, Kiichiro, 5,009,973, Cl. 430-45.000.

Capps, C. D.: *See—*
Falk, R. A.; Capps, C. D.; and Houk, T. L., 5,010,505, Cl. 364-713.000.

Caradon Mira Ltd.: *See—*
Ramshaw, Colin; and Winnington, Terence, 5,009,085, Cl. 62-476.000.

Carey, David R. Surface protective fastener tool. 5,009,133, Cl. 81-180.100.

Carlin, Frank J., to Grant TFW. Tool joint and method of hardfacing same. 5,010,225, Cl. 219-76.120.

Carlson, Dale R.: *See—*
Keil, Michael; Schirmer, Ulrich; Kast, Juergen; Kolassa, Dieter; Wuerzer, Bruno; Meyer, Norbert; Rademacher, Wilhelm; Jung, Johann; and Carlson, Dale R., 5,009,702, Cl. 71-100.000.

Carlsson, Anders; Johansson, Lars; and Soderlund, Frits, to Svenska Rotor Maskiner AB. Shaft seal and bearing members for a rotary screw compressor. 5,009,583, Cl. 418-104.000.

Carrier Corporation: *See—*
Zinsmeyer, Thomas M., 5,009,079, Cl. 62-218.000.

Carter, Jack D., Jr.: *See—*
Riffe, William J.; and Carter, Jack D., Jr., 5,009,757, Cl. 204-147.000.

Caruthers, Scott, to DAR Products Corporation. Grip facilitating handle. 5,009,416, Cl. 272-143.000.

Casadei, Alberto L.: *See—*
Nguyen, Tho Q.; and Casadei, Alberto L., 5,009,837, Cl. 376-261.000.

Case, Marvin L.; Sturm, Robert E.; and Herigstad, David P., to Haines & Emerson, Inc. Mobile vehicle and method for handling paper rolls. 5,009,563, Cl. 414-470.000.

Casio Computer Co., Ltd.: *See—*
Kawana, Shigeyuki, 5,010,237, Cl. 235-379.000.
Manabe, Hajime; and Murata, Yoshiyuki, 5,009,146, Cl. 84-615.000.

Casser, Carl: *See—*
Serini, Volker; Freitag, Dieter; Westeppe, Uwe; Idel, Karsten; Grigo, Ulrich; Casser, Carl; Paetz, Klaus-Christian; and Hajek, Manfred, 5,010,162, Cl. 528-196.000.
Serini, Volker; Freitag, Dieter; Westeppe, Uwe; Idel, Karsten; Grigo, Ulrich; Casser, Carl; Paetz, Klaus-Christian; and Hajek, Manfred, 5,010,163, Cl. 528-196.000.

Castellano, Thomas P., to Industrial Material Technology, Inc. Brake piston assembly. 5,009,291, Cl. 188-71.600.

Caterpillar Inc.: *See—*
Diekevers, Mark S.; and Fidler, Jerry D., 5,009,017, Cl. 37-142.00A.

Cauwet, Daniele: *See—*
Grollier, Jean-Francois; Fiquet, Claire; Fourcadier, Chantal; Dubief, Claude; and Cauwet, Daniele, 5,009,880, Cl. 424-047.000.

Cederholm, Roger; and Plude, Christopher J., to Martin Automatic, Inc. Web decurler. 5,009,749, Cl. 162-271.000.

Cedona Pharmaceuticals B.V.: *See—*
Sterk, Geert J.; Timmerman, Henk; and van der Goot, Henk, 5,010,095, Cl. 514-400.000.

Celona, Anthony R.: *See—*
Giangano, David A.; Kesselman, Martin; Bocskor, Steven; and Celona, Anthony R., 5,010,339, Cl. 341-164.000.

Central Glass Company, Limited: *See—*
Aratani, Shin-ichi, 5,009,691, Cl. 65-106.000.
Kandachi, Takayoshi, 5,010,042, Cl. 501-32.000.
Matsuda, Naohiko; and Makita, Kensuke, 5,009,933, Cl. 427-287.000.
Nishitani, Masami; and Suetomi, Joji, 5,009,694, Cl. 65-115.000.

Centre Technique Industriel dit: Institut Textile de France: *See—*
Gavet, Louis; Chatelin, Roger; Sotton, Michel; Guigal, Robert; and Laurent, Philippe, 5,009,846, Cl. 422-56.000.

CeraMem Corporation: *See—*
Goldsmith, Robert L., 5,009,781, Cl. 210-247.000.

Chabala, John C.: *See—*
Biftu, Tesfaye; Chabala, John C.; Bugianesi, Robert L.; Ponpipom, Mitree M.; and Sahoo, Soumya P., 5,010,100, Cl. 514-461.000.

Chaczyk, Adam W.; and Baumgarten, John M., to Babcock Industries, Inc. Sealed cable control system. 5,009,122, Cl. 74-502.600.

Chadwick, Thomas C.: *See—*
Ibsen, Robert L.; Chadwick, Thomas C.; and Pritchard, Sally A., 5,009,709, Cl. 106-35.000.

Chaize, Alain. Method and machine for working an area of ground, in particular for surfacing a road. 5,009,544, Cl. 404-72.000.

Chamberlain, Jerry: *See—*
Hernandez, Francisco; and Chamberlain, Jerry, 5,010,562, Cl. 378-125.000.

Chan, Alfred K.: *See—*
Sit, Hon P.; Galbi, David; and Chan, Alfred K., 5,010,508, Cl. 364-748.000.

Chan, May L.; and Turner, Alan D., to United States of America, Navy. Castable, insensitive energetic compositions. 5,009,728, Cl. 149-19.100.

Chance, Lynn C.; and Low, John A., to Agri-Tech Incorporated. Safety device for conveyor systems. 5,009,307, Cl. 198-538.000.

Chandler, Clifton B. Rotational movement training apparatus. 5,009,602, Cl. 434-300.000.

Chang, Chung N.; Hitzeman, Ronald A.; and Matteucci, Mark D., to Genentech, Inc. Use of yeast homologous signals to secrete heterologous proteins. 5,010,003, Cl. 435-69.900.

Chang, David B.: *See—*
Shih, I-Fu; Chang, David B.; Arns, James A.; Moss, Gaylord E.; and Smith, Ronald T., 5,009,502, Cl. 356-152.000.

Chang, Johnson S.: *See—*
Wang, Rong W.; and Chang, Johnson S., 5,008,975, Cl. 16-266.000.

Chang, Ker-Chin; Elkins, Clarence E.; Marshall, Paul A.; Dunwoodie, Duane E.; Mansour, Mohamed M.; Bauer, Paul R.; and Lobitz, Walter A., to Wiltron Company. Fault location operating system with loopback. 5,010,544, Cl. 370-13.100.

Chang, Ted. Removable magazine for staple guns. 5,009,356, Cl. 227-120.000.

Chapman Chemical Company: *See—*
West, Michael H.; and Overman, Gregg, 5,009,937, Cl. 427-440.000.

Chapman, Daniel J.: *See—*
Chapman, James A., 5,009,383, Cl. 248-343.000.

Chapman, George R., Jr.; Gorthey, Lee A.; and Priester, Donnan E., to Du Pont de Nemours, E. I., and Company. High melt viscosity fluoropolymer process aid. 5,010,130, Cl. 524-445.000.

Chapman, James A., to Chapman, Daniel J. Suspended ceiling electrical bracket. 5,009,383, Cl. 248-343.000.

Chapman, Richard A.: *See—*
Tang, Thomas E.; Wei, Che-Chia; Haken, Roger A.; and Chapman, Richard A., 5,010,032, Cl. 437-57.000.

Charbonnages de France: *See—*
Kita, Jean-Claude; Puff, Roger M.; Petrovic, Alexandre; and Chretien, Marcel, 5,009,852, Cl. 422-143.000.

Chariton, Zhenia J.; and Teixeira, Barbara J. Protective cover for a file folder. 5,009,361, Cl. 229-1.50R.

Charles, Harlan W., to General Motors Corporation. Wiper system for raked windshield. 5,009,459, Cl. 296-84.100.

Chatani, Masayuki: *See—*
Yoshida, Kimiyoshi; Sakano, Akio; Tamori, Hirofumi; and Chatani, Masayuki, 5,010,579, Cl. 382-13.000.

Chatelin, Roger: *See—*
Gavet, Louis; Chatelin, Roger; Sotton, Michel; Guigal, Robert; and Laurent, Philippe, 5,009,846, Cl. 422-56.000.

Chen, Jing-Den: *See*—
Liang, Rong-Chang; Colyer, Emerson K.; Chen, Jing-Den; Kintz, Karl A.; and Suen, Chih-Her, 5,010,114, Cl. 521-109.100.

Cheng, Hsien C.: *See*—
Palfreyman, Michael G.; Wiech, Norbert L.; Cheng, Hsien C.; and Kane, John M., 5,010,072, Cl. 514-183.000.

Chern, Terry S., to Du Pont de Nemours, E. I., and Company. On-line fiber heat treatment. 5,009,830, Cl. 264-290.500.

Cherukuri, Subraman R.; Raman, Krishna; Mansukhani, Gul; Cifrese, Ralph; and Wong, Lucy L., to Warner-Lambert Company. Breath-freshening edible compositions of methol and a carboxamide. 5,009,893, Cl. 424-440.000.

Cheung, Augustine C.: *See*—
Takeuchi, Kenji; Gagnon, Andre F.; Cheung, Augustine C.; and Meyer, Philip E., 5,009,833, Cl. 376-217.000.

Chew, Wai-Kwok: *See*—
Fong, Chi-Ming; Chew, Wai-Kwok; and Law, Garry C., 5,009,603, Cl. 434-323.000.

Chiang, Wen-Yen; and Hu, Chun-Min, to National Science Council. Acrylate/maleic anhydride copolymer grafted polyvinyl alcohol graft terpolymers. 5,010,134, Cl. 525-57.000.

Childers, Wayne E., Jr.: *See*—
Abou-Gharbia, Magid A.; Yardley, John P.; and Childers, Wayne E., Jr., 5,010,078, Cl. 514-252.000.

Chin, Timothy C.: *See*—
Damgaard-Iversen, Karsten; Morris, Robert C.; Chin, Timothy C.; and Kuper, Jerry W., 5,009,658, Cl. 606-128.000.

Ching-Yeu, Wei: *See*—
Possin, George E.; and Ching-Yeu, Wei, 5,010,027, Cl. 437-41.000.

Chiron Corporation: *See*—
Brake, Anthony J.; and Van Den Berg, Johan A., 5,010,182, Cl. 536-27.000.

Chisso Corporation: *See*—
Fujii, Masahiro; Hatakeyama, Masakazu; and Hiraki, Jun, 5,009,907, Cl. 426-335.000.
Fujita, Toshio; Yamashita, Yoshisato; Yoshida, Shigemitsu; and Yamahira, Katsutoshi, 5,009,696, Cl. 71-64.070.
Inoi, Takeshi, 5,010,109, Cl. 514-714.000.

Cho, Hyun S., to General Electric Company, The. Method for making polycrystalline sandwich compacts. 5,009,673, Cl. 51-293.000.

Choudhury, Pranab: *See*—
Balasubramanian, Mannarsamy; and Choudhury, Pranab, 5,010,157, Cl. 528-14.000.

Chow, Allan T.; and Luddy, Michael A. G., to Du Pont de Nemours, E. I., and Company. Method for performing heterogeneous immunoassay. 5,009,998, Cl. 435-7.920.

Chow, Wai Yan: *See*—
McElrath, Kenneth O., Jr.; Robertson, Martha H.; and Chow, Wai Yan, 5,010,119, Cl. 523-205.000.

Chretien, Marcel: *See*—
Kita, Jean-Claude; Puff, Roger M.; Petrovic, Alexandre; and Chretien, Marcel, 5,009,852, Cl. 422-143.000.

Christensen, Joergen A.: *See*—
Braestrup, Claus T.; Nielsen, Mogens C.; Christensen, Joergen A.; Engelstoft, Mogens; Schou, Henning; Eder, Ulrich; Neef, Gunter; Huth, Andreas; Rahtz, Dieter; and Schmiechen, Ralph, 5,010,077, Cl. 514-228.800.

Christensen, Leif: *See*—
Joergensen, Tage W.; and Christensen, Leif, 5,009,191, Cl. 119-20.000.

Christianson, Konrad A. Can crusher for household use. 5,009,155, Cl. 100-233.000.

Christie, Leslie G.: *See*—
Wanger, Mark E.; Methlie, Jennifer L.; Christie, Leslie G.; Dauner, Daniel R.; Domel, Douglas R.; Jones, David P.; Oliver, Thomas C.; and Stavely, Donald J., 5,010,536, Cl. 369-36.000.

Chuan-Tien, Chuang. Toy including fishing game and passive game elements. 5,009,418, Cl. 273-448.000.

Chuang, Karl T.; McMonagle, James B.; Quaiattini, Robert J.; Seddon, William A.; and Clegg, David E., to Atomic Energy of Canada Ltd. Method of oxidizing gaseous substances. 5,009,872, Cl. 423-245.300.

Chubb, Norman L.: *See*—
MacLeod, Richard J.; Chubb, Norman L.; and Schiedegger, Charles E., 5,009,149, Cl. 98-42.210.

Chul-woo, Kim: *See*—
Kwang-sik, Lee; and Chul-woo, Kim, 5,010,464, Cl. 362-284.000.

Chun, Soon-Ik, to SamSung Electronics Co., Ltd. Mobile radio transmitter using band expanding method. 5,010,557, Cl. 375-1.000.

Chuo Hatsujo Kabushiki Kaisha: *See*—
Sugimoto, Atsushi; Nakano, Osamu; Yasuda, Shigeru; Maeda, Chikatoshi; Ozone, Toshio; and Kawagoe, Makoto, 5,009,843, Cl. 420-112.000.

Chutorash, Richard J.: *See*—
Ruder, Carl J.; Haney, Ronald J.; Chutorash, Richard J.; Bostad, Wayne W.; Zweig, Arnold A.; and Payne, Lyle B., 5,009,560, Cl. 414-392.000.

Ciba-Geigy Corporation: *See*—
Berendt, Hans-Ulrich; and Topfl, Rosemarie, 5,009,668, Cl. 8-557.000.
Finter, Jurgen; Hilti, Bruno; Mayer, Carl W.; Minder, Ernst; and Pfeifer, Josef, 5,009,812, Cl. 252-500.000.
Herold, Peter; and Angst, Christof, 5,010,189, Cl. 544-174.000.
Jollenbeck, Martin; Berendt, Hans-Ulrich; and Fringeli, Werner, 5,009,669, Cl. 8-573.000.
Merz, Jurg, 5,010,184, Cl. 536-55.100.
Mueller, Karl F., 5,010,141, Cl. 525-276.000.
Mueller, Karl F., 5,010,155, Cl. 527-301.000.
Riebli, Peter, 5,010,082, Cl. 514-272.000.
Stingelin, Willy, 5,010,190, Cl. 544-198.000.

Cifrese, Ralph: *See*—
Cherukuri, Subraman R.; Raman, Krishna; Mansukhani, Gul; Cifrese, Ralph; and Wong, Lucy L., 5,009,893, Cl. 424-440.000.

Cifuentes, Martin E.: *See*—
Bank, Howard M.; Cifuentes, Martin E.; and Martin, Theresa E., 5,010,159, Cl. 528-23.000.

Cimperman, Frederick J.: *See*—
Hirtle, Thomas W.; Cimperman, Frederick J.; and Silbermann, Klaus, 5,009,909, Cl. 426-481.000.

Cinquemani, Paul L.: *See*—
Marciano-Agostinelli, Fabrizio; Barbaro-Forleo, Marco; Marin, Carlo; and Cinquemani, Paul L., 5,010,209, Cl. 174-23.00C.

Cislo, Daniel M. Modular lockbox and carrying case for pistols. 5,009,088, Cl. 70-63.000.

Citadel Investments Limited: *See*—
Nickel, Klaus-Dietrich, 5,009,371, Cl. 241-187.000.

Clairouin, Noel; Gueroult, Alain; and Lemoyne, Remi, to Nestec S.A. Reformed fish products. 5,009,918, Cl. 426-643.000.

Clapham, Terrance N., to VISX, Incorporated. Gas purging, eye fixation hand piece. 5,009,660, Cl. 606-166.000.

Clapp, Roy A. Process eliminating the use of a master positive film for making a duplicate negative of a color motion picture. 5,010,414, Cl. 358-244.000.

Clark Equipment Company: *See*—
Asche, James E., 5,009,566, Cl. 414-722.000.

Clark, Frank L. Device for relieving ear pain. 5,009,228, Cl. 128-380.000.

Clark, Frederick T.; Hensley, Albert L., Jr.; Lyzinski, David; and Peck, Lawrence B., to Amoco Corporation. Hydroconversion process using mixed catalyst system. 5,009,771, Cl. 208-216.0PP.

Clark, Jack P.: *See*—
Richardson, David L.; Clark, Jack P.; Kowdley, Balasubramanian S.; Patterson, Peter M.; Perry, Richard W.; and Smith, Thurman D., 5,009,105, Cl. 73-621.000.

Clark, Jeff A. Water spray for cement finisher. 5,009,547, Cl. 404-112.000.

Clarke, Douglas C. Pneumatic cylinder with positioning, braking, and feed rate control. 5,009,068, Cl. 60-583.000.

Clarke, Neville; and Hansen, Reimer Z., to Conoco Specialty Products Inc. Cyclone separator with oppositely directed separating chambers. 5,009,784, Cl. 210-512.100.

Clauss, Julius A.: *See*—
Ivey, John S.; Bateman, Paul M.; Clauss, Julius A.; Cole, Edward H., Jr.; and Mott, Philip J., 5,009,631, Cl. 474-213.000.

Clayton, Simon N.; Lambert, Peter M.; and Wevers, Jean, to Procter & Gamble Company, The. Granular laundry compositions containing multi ingredient components having disparate rates of solubility. 5,009,804, Cl. 252-90.000.

Cleary, Terrance M.; Donahue, Raymond J.; Hesterberg, William G.; and Toriello, Lawrence I., to Brunswick Corporation. Vacuum lift foam filled casting system. 5,009,260, Cl. 164-255.000.

Clegg, David E.: *See*—
Chuang, Karl T.; McMonagle, James B.; Quaiattini, Robert J.; Seddon, William A.; and Clegg, David E., 5,009,872, Cl. 423-245.300.

Cloyd, Willard C.; and Nelson, Robert M., to Hexcel Corporation. Method for coating fabric surface with electrically conductive film. 5,009,927, Cl. 427-121.000.

Clumpner, J. Michael: *See*—
O'Lenick, Anthony J., Jr.; Miller, John C.; and Clumpner, J. Michael, 5,010,173, Cl. 528-408.000.

Coates, Don M.; and Young, Patrick H., to Du Pont de Nemours, E. I., and Company. Process of making acicular para-aramide particles. 5,009,820, Cl. 264-13.000.

Cocciadiferro, Michael J.; and De Serio, Robert J., to American Standard Inc. Method and apparatus for protecting the finished surfaces of sanitary fixtures. 5,009,059, Cl. 53-472.000.

Cohen, Allen L. Contact lenses utilizing keel orientation. 5,009,497, Cl. 351-161.000.

Cohen, Richmond R.; and Luzio, Gary A., to Hoechst Celanese Corporation. Selective delivery and retention of aldehyde and nicotine by-product from cigarette smoke. 5,009,239, Cl. 131-342.000.

Colafati, Ralph. Water blown foam. 5,010,116, Cl. 521-155.000.

Cole, Edward H., Jr.: *See*—
Ivey, John S.; Bateman, Paul M.; Clauss, Julius A.; Cole, Edward H., Jr.; and Mott, Philip J., 5,009,631, Cl. 474-213.000.

Cole, Susan M., to Minnesota Mining and Manufacturing Company. Method for attaching a pressure-sensitive film article having high moisture vapor transmission rate. 5,009,224, Cl. 128-156.000.

Coleman, Darold D.; and Nesseth, Raymond P., to NTH, Inc. Wire mesh straightening method and apparatus. 5,009,545, Cl. 404-100.000.

Collier, Billie J.: *See*—
Collier, John R.; and Collier, Billie J., 5,009,954, Cl. 428-400.000.

Collier, John R.; and Collier, Billie J., to Ohio University. Sheath core fiber and its method of manufacture. 5,009,954, Cl. 428-400.000.

Collins, Aaron A.: *See*—
Scheller, Clifford D.; Collins, Aaron A.; and Hansen, Joseph M., 5,010,553, Cl. 371-35.000.

Colliopoulos, John A., to Procter & Gamble Company, The. Psyllium mucilloid fiber food products. 5,009,916, Cl. 426-615.000.

Colombier, Christian; and Cuer, Jean-Pierre, to Atochem. Process for preparing polysiloxazane compositions and the products formed thereby. 5,010,158, Cl. 528-28.000.

Colorado National Manufacturers, Inc.: *See*—
Urich, Oren D.; and Meyer, Vernie G., 5,009,062, Cl. 56-341.000.

Coltec Industries Inc.: *See*—
Kline, Loren H.; Sherwin, Harry A.; and Telep, Robert J., 5,009,250, Cl. 137-596.170.
McAuliffe, Lawrence, Jr.; and Hardy, Sidney D., 5,009,390, Cl. 251-129.200.
Stonehocker, Van T., 5,010,487, Cl. 364-424.030.

Coltene/Whaledent, Inc.: *See*—
Vogelstein, Henry J., 5,009,593, Cl. 433-221.000.

Coltrain, Bradley K.; Ferrar, Wayne T.; and Landry, Christine J., to Eastman Kodak Company. Composites of etheric phosphazene and metal oxides and the method of their formation. 5,010,128, Cl. 524-405.000.

Columbian Chemicals Company: *See*—
Jones, William R., Jr., 5,009,854, Cl. 422-150.000.

Colyer, Emerson K.: *See*—
Liang, Rong-Chang; Colyer, Emerson K.; Chen, Jing-Den; Kintz, Karl A.; and Suen, Chih-Her, 5,010,114, Cl. 521-109.100.

Commonwealth Edison Company: *See*—
Scannell, Michael B., 5,010,446, Cl. 361-398.000.

Commonwealth Scientific & Industrial Research Organisation & Telectronics Pty. Limited: *See*—
Steele, John; Johansen, Oddvar; Johnson, Graham; and Hodgkin, Johnathon, 5,010,009, Cl. 435-240.243.

Compagnie Oris Industrie S.A.: *See*—
Ferrua, Bernard; and Moulin, Claude, 5,010,017, Cl. 436-500.000.

Compuquest, Inc.: *See*—
Scheller, Clifford D.; Collins, Aaron A.; and Hansen, Joseph M., 5,010,553, Cl. 371-35.000.

Computed Anatomy Inc.: *See*—
Gersten, Martin; Tibbling, Lars; and Maus, Roy, 5,009,498, Cl. 351-212.000.

Conard, Harry W.: *See*—
Qamar, Sohail S.; Conard, Harry W.; and Hamilton, Lowell E., 5,009,765, Cl. 204-298.120.

Condar, Inc.: *See*—
Cornelison, Peter S., 5,009,220, Cl. 126-523.000.

Condon, Michael E.: *See*—
Brady, Thomas E.; Condon, Michael E.; and Marc, Pierre A., 5,009,699, Cl. 71-92.000.

Connell, John W.: *See*—
Hergenrother, Paul M.; and Connell, John W., 5,010,197, Cl. 544-353.000.

Connelly, Lawrence J.: *See*—
Kerr, E. Michael; Connelly, Lawrence J.; Roe, William J.; and Vallowe, Robert M., 5,009,873, Cl. 423-320.000.

Conoco Inc.: *See*—
Jones, Richard L., 5,010,126, Cl. 524-349.000.
Moran, Larry K.; and Murray, Thomas R., 5,009,269, Cl. 166-293.000.

Conoco Specialty Products Inc.: *See*—
Clarke, Neville; and Hansen, Reimer Z., 5,009,784, Cl. 210-512.100.
Webb, David A., 5,009,785, Cl. 210-512.200.

Consolidation Coal Company: *See*—
Fenger, Michael L.; and Vargo, Francis R., 5,009,856, Cl. 422-178.000.

Conti, Josef: *See*—
Mueller, Hans R.; Ulmann, Martin; Conti, Josef; and Muerdel, Guenter, 5,010,194, Cl. 544-258.000.

Control Fluidics, Inc.: *See*—
Banks, James V., 5,009,776, Cl. 210-108.000.

Conway, John: *See*—
Yelland, Michael; and Conway, John, 5,010,192, Cl. 544-239.000.

Cook, Lacy G.: *See*—
Iossi, Daryl R.; Cook, Lacy G.; and Koppensteiner, Alfred, 5,009,494, Cl. 350-620.000.

Cook, Phillip M.; and Hess, Steven L., to Eastman Kodak Company. Organosolv lignin-modified phenolic resins and method for their preparation. 5,010,156, Cl. 527-403.000.

Cooke, Paul W.; and Taylor, Geoffrey W., to AT&T Bell Laboratories. Quantum well laser utilizing an inversion layer. 5,010,374, Cl. 357-16.000.

Cooley, Edwin L. Bulk material handling apparatus. 5,009,344, Cl. 222-325.000.

Cooper Industries, Inc.: *See*—
Nance, James G., 5,009,289, Cl. 188-67.000.

Coppage, Edward A., Jr.; and Coppage, Richard W. Bulletproof dress shirt. 5,008,959, Cl. 2-2.500.

Coppage, Richard W.: *See*—
Coppage, Edward A., Jr.; and Coppage, Richard W., 5,008,959, Cl. 2-2.500.

Coppi, Germano: *See*—
Poli, Stefano; Coppi, Germano; and Del Corona, Lucio, 5,010,108, Cl. 514-619.000.

Coppola, Richard; and Khandaghabadi, Farrokh, to Schlumberger Industries, Inc. Optical port multiplexer for electric metering equipment. 5,010,335, Cl. 340-870.280.

Corbett, Peter F.: *See*—
Hartley, Richard I.; and Corbett, Peter F., 5,010,511, Cl. 364-786.000.

Corbitt, Newsome E., III. Fish hook including an improved bait guard with a slider. 5,009,026, Cl. 43-44.800.

Cordery, Robert A., to Pitney Bowes Inc. Self modulating electronic article surveillance marker. 5,010,320, Cl. 340-551.000.

Cornelison, Peter S., to Condar, Inc. Safety enclosure for coal, gas or wood-burning fireplace. 5,009,220, Cl. 126-523.000.

Cornerstone Products Inc.: *See*—
van Druff, Albert, Jr.; and Fussell, David A., 5,009,366, Cl. 232-17.000.

Corning Incorporated: *See*—
Miller, William J.; and Truesdale, Carlton M., 5,009,692, Cl. 65-3.110.

Correll, Robert S., Jr.; and Wiltraut, David D., to AMP Incorporated. Method of assembling components to electrical terminals. 5,008,999, Cl. 29-882.000.

Corvaglia, Romeo; and Schottli, Martin, to Schottli AG. Injection molding machine for making tubular workpieces from plastic material. 5,009,587, Cl. 425-549.000.

Costanza, Daniel W.: *See*—
Nowak, William J.; Attardi, Anthony A.; and Costanza, Daniel W., 5,010,369, Cl. 355-273.000.

Cotey, John; and Jahanger, Mohammed S., to Jahanger, Mohammed S. Umbilical cord cutting and clamping device. 5,009,657, Cl. 606-120.000.

Cottell, Eric C. Method of removing oil from birds and animals. 5,009,197, Cl. 119-159.000.

Cottringer, Thomas E.: *See*—
Rue, Charles V.; van de Merwe, Ronald H.; Bauer, Ralph; Pellow, Scott W.; Cottringer, Thomas E.; and Klok, Richard J., 5,009,676, Cl. 51-309.000.

Coughlin, Robert W. Partially treated shellfish waste for removal of heavy metals from aqueous solution. 5,010,181, Cl. 536-20.000.

Coulson, Ian: *See*—
Morris, Christopher J.; Coulson, Ian; and Surguy, Paul W. H., 5,010,328, Cl. 340-784.000.

Courier de Mere, Henri. Electronic converter supplied by an alternating current distribution network. 5,010,277, Cl. 315-200.00R.

Courtright, David A.: *See*—
O'Connor, James T.; and Courtright, David A., 5,010,559, Cl. 375-116.000.

Cowger, Bruce; Dion, John H.; and Peters, William E., to Hewlett-Packard Company. Ink jet pen with improved volumetric efficiency. 5,010,354, Cl. 346-140.00R.

Cowley, Nicholas P., to Plessey Overseas Limited. Crystal oscillator with offset and hysteresis. 5,010,308, Cl. 331-116.00R.

Cox, Robert W. Golf club guide means. 5,009,426, Cl. 273-186.00A.

Cox, Roger G.; Reber, Mark A.; and Yeager, Michael W., to United Technologies Corporation. Accumulator for complex numbers. 5,010,509, Cl. 364-748.000.

Craft, William K., to Batesville Casket Company, Inc. Hardware for mounting a casket handle bar. 5,008,990, Cl. 27-2.000.

Crane Co.: *See*—
Hyland, George J., 5,009,578, Cl. 417-365.000.

Creative Binding Systems, Inc.: *See*—
Stengel, Philip B., 5,009,537, Cl. 402-21.000.

Croll, Michael G., to British Broadcasting Corporation. Method of and apparatus for receiving high definition television signals. 5,010,392, Cl. 358-21.00R.

Cros, Patrick; and Pipon, Robert, to Rhone-Poulenc Specialties Chimiques. Acid/heat modified polysaccharide biopolymers. 5,010,186, Cl. 536-114.000.

Cross, David E.; Brooks, Kenneth J.; and Whiteside, Neil A., to Smiths Industries Public Limited Company. Water closet disposable ostomy bags and materials. 5,009,647, Cl. 604-332.000.

Crowell, Terry M.: *See*—
Secretarski, James M.; and Crowell, Terry M., 5,009,848, Cl. 422-62.000.

Crumly, William R.; Woith, Blake F.; and Walen, James R., to Hughes Aircraft Company. Flat electrical connector assembly with precisely aligned soldering traces. 5,009,605, Cl. 439-67.000.

CTB, Inc.: *See*—
Yoder, Dennis G., 5,009,045, Cl. 52-177.000.

Cuer, Jean-Pierre: *See*—
Colombier, Christian; and Cuer, Jean-Pierre, 5,010,158, Cl. 528-28.000.

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Rasmussen, James M., 5,009,627, Cl. 453-10.000.

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Villanyi, Tibor J.; and Westerson, Kevin W., 5,009,435, Cl. 277-23.000.

Cur, Omer N.: *See*—
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Cutler, Christopher A.: *See*—
Wallace, William D.; Cutler, Christopher A.; and Gentry, Scott D., 5,009,662, Cl. 606-192.000.

Cutolo, Antonello: *See*—
Madey, John M. J.; Benson, Stephen V.; Schultz, John F.; and Cutolo, Antonello, 5,010,555, Cl. 372-2.000.

Dahl, Helmut: *See—*
Skuballa, Werner; Dahl, Helmut; Vorbrueggen, Helmut; Loge, Olaf; and Thierauch, Karl-Heinz, 5,010,065, Cl. 514-58.000.

Dai Nippon Printing Co., Ltd.: *See—*
Higuchi, Naoshige; and Miyake, Toru, 5,009,972, Cl. 430-7.000.

Daicel Chemical Industries, Ltd.: *See—*
Ikada, Yoshito; and Gen, Shokyu, 5,010,145, Cl. 525-415.000.

Daido, Takahiro: *See—*
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Masuda, Kenji, 5,009,248, Cl. 137-486.000.

Daikyo Gomu Seiko Ltd.: *See—*
Sudo, Masamichi; and Okuda, Tamotsu, 5,009,646, Cl. 604-230.000.

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Sacco, Bruno; Tomforde, Johann; Abb, Thomas; and Stenemann, Bruno, 5,009,042, Cl. 52-36.000.

Dainippon Screen Mfg. Co., Ltd.: *See—*
Endo, Kenji; and Nagata, Shinichi, 5,010,465, Cl. 362-337.000.

Dairy Research, Inc.: *See—*
Ahmed, Salah H.; and Luksas, Anthony J., 5,009,913, Cl. 426-581.000.

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Dias, Donald R.; Lee, Robert D.; Bolan, Michael L.; and Scherpenberg, Francis A., 5,010,331, Cl. 340-825.310.

Dambach-Werke GmbH: *See—*
Killinger, Erich, 5,010,319, Cl. 340-472.000.

Damcosur S.A. De C.V.: *See—*
Bustamante, Michael R.; Renaker, John J., Jr.; and Magley, Donald A., 5,009,790, Cl. 210-689.000.

Damerow, David H.: *See—*
Yost, Richard A.; and Damerow, David H., 5,010,558, Cl. 375-37.000.

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Damm, Hiltraut M. Animal grooming device and process. 5,009,195, Cl. 119-86.000.

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D'Aquila, Anthony; Smart, Charles F.; and Varian, Raymond H., to Emhart Inc. Automatic riveting machine. 5,009,354, Cl. 227-2.000.

DAR Products Corporation: *See—*
Caruthers, Scott, 5,009,416, Cl. 272-143.000.

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Manderfeld, Donald J.; and Sells, Robert A., 5,009,411, Cl. 271-129.000.
Sannel, Benjamin H.; Miller, Steven A.; and Sells, Robert A., 5,009,332, Cl. 209-652.000.

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Wanger, Mark E.; Methlie, Jennifer L.; Christie, Leslie G.; Dauner, Daniel R.; Domel, Douglas R.; Jones, David P.; Oliver, Thomas C.; and Stavely, Donald J., 5,010,536, Cl. 369-36.000.

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Avery, Leslie R., 5,010,380, Cl. 357-23.130.

Davis, Darrel B. Self aligning coupling apparatus. 5,009,446, Cl. 280-479.200.

Davis, Gordon T., to International Business Machines Corporation. Time multiplexed system for tightly coupling pipelined processors to separate shared instruction and data storage units. 5,010,476, Cl. 364-200.000.

Davis, Mark L., to Hewlett-Packard Company. Apparatus and process for measuring data disk runout and acceleration parameters. 5,010,535, Cl. 369-32.000.

DCA Food Industries, Inc.: *See—*
deFigueiredo, Mario P.; and Brady, Richard L., 5,009,903, Cl. 426-243.000.

De La Rue Giori S.A.: *See—*
Germann, Albrecht J., 5,009,156, Cl. 101-177.000.

de la Prieta, Claudio: *See—*
Fedter, Horst; Grunwald, Werner; Nolting, Peter; de la Prieta, Claudio; and Schmid, Kurt, 5,010,315, Cl. 338-7.000.
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Debe, Mark K., to Minnesota Mining and Manufacturing Company. Low gravity enhanced growth of phthalocyanine polymorph films. 5,009,948, Cl. 428-141.000.

de Beer, Freddy: *See—*
Klaassens, J. Ben; Lauw, Hian K.; and de Beer, Freddy, 5,010,471, Cl. 363-160.000.

De Cleyn, Rene ; Thometzek, Peter; and Rademachers, Jakob, to Bayer Aktiengesellschaft. Titanium dioxide, a process for its production and its use. 5,009,879, Cl. 423-610.000.

deFigueiredo, Mario P.; and Brady, Richard L., to DCA Food Industries, Inc. Method of making fried pie. 5,009,903, Cl. 426-243.000.

DeFonce, Michael A. Variable axis knee brace. 5,009,223, Cl. 128-80.00C.

Defosse, Gerard: *See—*
Manoury, Philippe; Binet, Jean; Obitz, Daniel; Defosse, Gerard; Dewitte, Elisabeth; and Veronique, Corinne, 5,010,079, Cl. 514-253.000.

DeFranceschi, Roberto: *See—*
Braglia, Marco; DeFranceschi, Roberto; and Montangero, Paolo, 5,010,253, Cl. 250-399.000.

Degenhardt, Charles R.; and Kozikowski, Barbara A., to Proctor & Gamble Company, The. Use of a carboxy starch polymer to inhibit plaque without tooth staining. 5,009,882, Cl. 424-52.000.

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Miller, Bill L.; Perry, H. Bruce; and DeGregorio, Robert, 5,009,899, Cl. 426-2.000.

Deguchi, Toshihisa: *See—*
Fuji, Hiroshi; Fujiwara, Tsuneo; Iwaki, Takashi; Numata, Tomiyuki; Tsuji, Kentaroh; Maeda, Shigemi; Yamaguchi, Takeshi; Kojima, Kunio; Deguchi, Toshihisa; and Terashima, Shigeo, 5,010,540, Cl. 369-50.000.

Degussa Aktiengesellschaft: *See—*
Deschler, Ulrich; and Kleinschmit, Peter, 5,010,203, Cl. 548-110.000.

DeJong, Allan W.: *See—*
Sewell, Michael R.; and DeJong, Allan W., 5,010,216, Cl. 200-61.45M.

Dekeyser, Mark A.; and Moore, Richard C., to Uniroyal Chemical Company, Inc.; and Uniroyal Chemical Ltd. Ltee. Oxadiazinyl organophosphorus pesticides. 5,010,068, Cl. 514-79.000.

DeLaRosa, Robert L., to General Motors Corporation. Method of painting clay bodies. 5,009,600, Cl. 434-82.000.

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Starr, George N., 5,009,287, Cl. 187-8.410.

Delaware Investments Corp.: *See—*
Swartz, Roy, 5,009,551, Cl. 406-128.000.

Del Corona, Lucio: *See—*
Poli, Stefano; Coppi, Germano; and Del Corona, Lucio, 5,010,108, Cl. 514-619.000.

Del Fabro, Giorgio: *See—*
Del Fabro, Marcello; and Del Fabro, Giorgio, 5,009,097, Cl. 72-387.000.

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Dell Corporate Services Corporation: *See—*
Busch, John P., 5,008,976, Cl. 16-276.000.

Del Soldato, Piero: *See—*
Boghen, Franklin M.; Camanni, Franco; Del Soldato, Piero; Ghigo, Ezio; and Muller, Eugenio, 5,010,056, Cl. 514-12.000.

DeLuca, Joan S.: *See—*
Johnson, Richard E.; Kabcenell, Amy R.; and DeLuca, Joan S., 5,010,547, Cl. 370-94.100.

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Roldan, Antoine; and Demilliere-Vergnais, Daniel, 5,009,592, Cl. 432-222.000.

Den-Mat Corporation: *See—*
Ibsen, Robert L.; Chadwick, Thomas C.; and Pritchard, Sally A., 5,009,709, Cl. 106-35.000.

Denar Corporation: *See—*
West, Weldon D., 5,009,594, Cl. 433-73.000.

den Hartog, Huibert; and van Perlstein, Erik B., to Hoogovens Groep B.V. Method and apparatus for the manufacture of formable steel strip. 5,009,396, Cl. 266-115.000.

Dennis, William G., Jr.: *See—*
Bilsbury, Stephen J.; Dennis, William G., Jr.; and Kernosky, Stephen K., 5,009,166, Cl. 102-516.000.

Denzinger, Walter: *See—*
Martischius, Franz-Dieter; Vogel, Hans-Henning; Greif, Norbert; Oppenlaender, Knut; Denzinger, Walter; and Hartmann, Heinrich, 5,009,670, Cl. 44-385.000.
Perner, Johannes; Diessel, Paul; Hartmann, Heinrich; Denzinger, Walter; Oftring, Alfred; and Schoenleben, Willibald, 5,009,805, Cl. 252-174.240.

De Prijcker, Jozef P.: *See—*
De Rycke, Gino L.; Rutges, Antonius A.; and De Prijcker, Jozef P., 5,009,984, Cl. 430-404.000.

Deran, Roger L. Entity-attribute value database system with inverse attribute for selectively relating two different entities. 5,010,478, Cl. 364-200.000.

Derkatz, Keith. Knife sheath of tough flexible material. 5,009,348, Cl. 224-232.000.

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Deschler, Gerhard, to MAN Nutzfahrzeuge Aktiengesellschaft. Method of increasing the fatigue strength of crankshafts. 5,009,001, Cl. 29-888.080.

Deschler, Ulrich; and Kleinschmit, Peter, to Degussa Aktiengesellschaft. Method of preparing organyloxysilyl. 5,010,203, Cl. 548-110.000.

De Serio, Robert J.: *See—*
Cocciadiferro, Michael J.; and De Serio, Robert J., 5,009,059, Cl. 53-472.000.

Desorcie, James L.; and O'Brien, Michael J., to General Electric Company. UV curable non-toxic epoxysilicone release coating compositions. 5,010,118, Cl. 522-31.000.

Desroches, Lise A.: *See—*
Sidi, Shiraz I.; Guilbert, Paul A.; Desroches, Lise A.; and Plasse, Michel, 5,010,210, Cl. 174-34.000.

Dessirier, Charles, to Bost S.A. Assembly device and processes of using said device. 5,009,557, Cl. 411-504.000.

Dewitte, Elisabeth: *See—*
Manoury, Philippe; Binet, Jean; Obitz, Daniel; Defosse, Gerard; Dewitte, Elisabeth; and Veronique, Corinne, 5,010,079, Cl. 514-253.000.

Dexter Corporation, The: *See—*
Viazmensky, Helen; Richard, Carl E.; and Williamson, James E., 5,009,747, Cl. 162-115.000.

Diaglobe Aktiebolag: *See—*
Johansson, Mats, 5,009,011, Cl. 30-389.000.

Dias, Bernard; and du Chene, Arnaud, to Thomson-CSF. Device and method for the generation of test vectors and testing method for integrated circuits. 5,010,552, Cl. 371-27.000.

Dias, Donald R.; Lee, Robert D.; Bolan, Michael L.; and Scherpenberg, Francis A., to Dallas Semiconductor Corporation. Time-key integrated circuit. 5,010,331, Cl. 340-825.310.

Dicke, Curtis J., to United Technologies Corporation. Gate output driver using slew-rate control. 5,010,256, Cl. 307-263.000.

Dicks, Lori A.: *See—*
Dunaway, Thomas J.; Spielberger, Richard K.; Dicks, Lori A.; and Loy, Jerald M., 5,010,387, Cl. 357-70.000.

Diebel, Heinz; Peterhoff, Ralf; and Thuemling, Evelyn, to Hewlett-Packard Company. Method and apparatus for generating representations of 3-dimensional objects. 5,010,502, Cl. 364-522.000.

Diehl, Robert E.: *See—*
Brown, Dale G.; Siddens, Jack K.; Diehl, Robert E.; and Wright, Donald P., Jr., 5,010,098, Cl. 514-426.000.

Diekevers, Mark S.; and Fidler, Jerry D., to Caterpillar Inc. Retaining pin having a positive keeper means. 5,009,017, Cl. 37-142.00A.

Dierikx, Bart M. H. L., to Interuniversitair Micro-Elektronica Centrum VZW. Radiation transducing device with location identification. 5,010,245, Cl. 250-208.100.

Diessel, Paul: *See—*
Perner, Johannes; Diessel, Paul; Hartmann, Heinrich; Denzinger, Walter; Oftring, Alfred; and Schoenleben, Willibald, 5,009,805, Cl. 252-174.240.

Dieter, Douglas K., to Solvent Services, Inc.,; and Nagpal, Amit, part interest to each. Method for in situ contaminant extraction from soil. 5,009,266, Cl. 166-245.000.

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Kunz, Reiner; Babl, Albert; Zahradnicek, Ales; and Dietrich, Rainer, 5,009,674, Cl. 51-295.000.
Kunz, Reiner; and Dietrich, Rainer, 5,009,675, Cl. 51-295.000.

Digital Equipment Corp.: *See—*
Fox, Leslie R.; Wade, Paul C.; and Schmidt, William L., 5,010,038, Cl. 437-215.000.

Dijken, Reinder H., to U.S. Philips Corporation. Electrical multi-pole machine. 5,010,268, Cl. 310-254.000.

Di Maio, William G.: *See—*
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Di Nunzio, Vittorio; Giaccardi, Eraldo; and Saluzzo, Sergio, to Fiat Auto S.p.A. Static ignition device for internal combustion engines. 5,009,213, Cl. 123-620.000.

Dion, John H.: *See—*
Cowger, Bruce; Dion, John H.; and Peters, William E., 5,010,354, Cl. 346-140.00R.

DiPippo, Ascanio G., to Trilling Medical Technologies, Inc. Burn treatment product. 5,009,890, Cl. 424-195.100.

Dittenhoefer, Thomas, to SKF GmbH. Double row, self aligning roller bearing. 5,009,524, Cl. 384-475.000.

Diversey Corporation: *See—*
Wider, Michael; Rossio, Charles; and Remus, Christian, 5,009,801, Cl. 252-033.200.

Dixon, Daniel A.: *See—*
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Dobler, Walter: *See—*
Hermeling, Dieter; Becker, Rainer; and Dobler, Walter, 5,009,753, Cl. 204-75.000.

Dobrowolski, Jerzy A.; Ho, Fang C.; and Waldorf, Allan J., to Canadian Patents and Development Limited/Societe Canadienne des Brevets et d'Exploitation Limitee. Form depicting, optical interference authenticating device. 5,009,486, Cl. 350-164.000.

Dr. Ing. h.c.F. Porsche AG: *See—*
Ott, Gerhard, 5,009,400, Cl. 267-64.110.
Seidel, Willi; Ehniss, Roland; Skabrond, Klaus; Sauter, Ulrich; Maier, Ulrich; and Ebner, Roland, 5,009,128, Cl. 74-866.000.

Dr. Johannes Heidenhain GmbH: *See—*
Spies, Alfons, 5,009,506, Cl. 356-356.000.

Dodd, Courtney V.; and Munie, Gregory C., to AT&T Bell Laboratories. Soldering flux and method of its use in fabricating and assembling circuit boards. 5,009,724, Cl. 148-23.000.

Doherty, Mark M.: *See—*
Antonelli, Joseph A.; Scopazzi, Christopher; and Doherty, Mark M., 5,010,140, Cl. 525-269.000.

Domel, Douglas R.: *See—*
Wanger, Mark E.; Methlie, Jennifer L.; Christie, Leslie G.; Dauner, Daniel R.; Domel, Douglas R.; Jones, David P.; Oliver, Thomas C.; and Stavely, Donald J., 5,010,536, Cl. 369-36.000.

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Goodman, David D.; and Domnitz, Robert, 5,010,399, Cl. 358-85.000.

Donahoe, Patricia K., to General Hospital Corporation, The. Use of EGF to reverse the contraceptive activity of MIS. 5,010,055, Cl. 514-8.000.

Donahue, Raymond J.: *See—*
Cleary, Terrance M.; Donahue, Raymond J.; Hesterberg, William G.; and Toriello, Lawrence I., 5,009,260, Cl. 164-255.000.

Donofrio, Deborah K.; and Whitekettle, Wilson K., to Betz Laboratories, Inc. Biocidal compositions and use thereof containing a synergistic mixture of N-tributyl tetradecyl phosphonium chloride and N-dodecylguanidine. 5,010,066, Cl. 514-75.000.

Dosaj, Vishu D.: *See—*
Arvidson, Arvid N.; Dosaj, Vishu D.; and May, James B., 5,009,703, Cl. 75-10.360.

Dosaka, Katsumi: *See—*
Inoue, Yoshinori; Kumanoya, Masaki; Komatsu, Takahiro; Konishi, Yasuhiro; and Dosaka, Katsumi, 5,010,259, Cl. 307-482.000.

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Doukhan, Marc: *See—*
Laurent, Michel; Doukhan, Marc; and Noualhaguet, Pierre, 5,010,563, Cl. 378-132.000.

Dover, Harold P.: *See—*
McManus, Michael J.; Berry, David H.; and Dover, Harold P., 5,009,947, Cl. 428-122.000.

Dow Chemical Company, The: *See—*
Foster, Stephen I.; Stimler, Jeffrey J.; and Nonnemacher, Gail S., 5,009,953, Cl. 428-327.000.
Herrington, Ronald M.; Turner, Robert B.; and Matijega, Roney J., 5,010,117, Cl. 521-159.000.
Heuvelsland, Albert J., 5,010,187, Cl. 536-120.000.
McCree, John O., 5,009,828, Cl. 264-177.100.
Van Heertum, John C.; Gerwick, Ben C., III; and Kleschick, William A., 5,010,195, Cl. 544-263.000.
Watanabe, Chuichi, 5,009,531, Cl. 432-128.000.

Dow Corning Corporation: *See—*
Arvidson, Arvid N.; Dosaj, Vishu D.; and May, James B., 5,009,703, Cl. 75-10.360.
Bank, Howard M.; Cifuentes, Martin E.; and Martin, Theresa E., 5,010,159, Cl. 528-23.000.
Lee, Chi-Long; and Willis, Robin L., Jr., 5,009,957, Cl. 428-402.220.

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Grisoni, Bernard F., 5,010,115, Cl. 521-154.000.

Dowbrowski, Adrian T.: *See—*
Harth, Arthur; Dowbrowski, Adrian T.; and Williams, Bernard O., 5,009,424, Cl. 273-85.00D.

Draehn, Ricky L.: *See—*
Gardner, Wallace R.; Goodman, Kenneth R.; Puckett, Robert D.; and Draehn, Ricky L., 5,010,333, Cl. 340-856.000.

Dragerwerk Aktiengesellschaft: *See—*
Koch, Edmund; and Pruss, Dieter, 5,009,493, Cl. 350-619.000.

Dresser Industries, Inc.: *See—*
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Drilex Systems, Inc.: *See—*
Bailey, Thomas F.; Lancaster, Charles E.; and Lee, Richard, 5,009,265, Cl. 166-118.000.

Driver, Joseph W.: *See—*
Lager, Kjell; Tarnstrom, Anders; Ostlund, Olov; and Driver, Joseph W., 5,009,039, Cl. 51-165.770.

Druelle, Philippe: *See—*
Bonnand, Christian; Mascart, Dominique; and Druelle, Philippe, 5,008,996, Cl. 29-727.000.

Drummond, George S.: *See—*
Kappas, Attallah; and Drummond, George S., 5,010,073, Cl. 514-185.000.

DSP Technology: *See—*
Natarajan, T. Raj, 5,010,480, Cl. 364-200.000.

Duarte, Eduardo. Transfer cylinder for printing press. 5,009,160, Cl. 101-422.000.

Dubief, Claude: *See—*
Grollier, Jean-Francois; Fiquet, Claire; Fourcadier, Chantal; Dubief, Claude; and Cauwet, Daniele, 5,009,880, Cl. 424-047.000.

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Dias, Bernard; and du Chene, Arnaud, 5,010,552, Cl. 371-27.000.

Dudney, Frank A. R. Cooling systems for marine motors. 5,009,622, Cl. 440-88.000.

Duff, Sheldon J. B.; and Murray, William D. Bio-oxidation of high alcohols in non-aqueous reaction media. 5,010,005, Cl. 435-147.000.

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Jacobs, James R., 5,010,473, Cl. 364-150.000.

Dunaway, Thomas J.; Spielberger, Richard K.; Dicks, Lori A.; and Loy, Jerald M., to Honeywell Inc. Solder bonding material. 5,010,387, Cl. 357-70.000.

Dunn, Joseph T., to Genzyme Corporation. Therapeutic enzyme-antibody complexes. 5,009,888, Cl. 424-94.300.

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Chang, Ker-Chin; Elkins, Clarence E.; Marshall, Paul A.; Dunwoodie, Duane E.; Mansour, Mohamed M.; Bauer, Paul R.; and Lobitz, Walter A., 5,010,544, Cl. 370-13.100.

Du Pont de Nemours, E. I., and Company: *See—*
Antonelli, Joseph A.; Scopazzi, Christopher; and Doherty, Mark M., 5,010,140, Cl. 525-269.000.
Benin, Joshua; Di Maio, William G.; Morin, Carl F.; and Lawler, James A., 5,009,942, Cl. 428-36.600.
Chapman, George R., Jr.; Gorthey, Lee A.; and Priester, Donnan E., 5,010,130, Cl. 524-445.000.
Chern, Terry S., 5,009,830, Cl. 264-290.500.
Chow, Allan T.; and Luddy, Michael A. G., 5,009,998, Cl. 435-7.920.
Coates, Don M.; and Young, Patrick H., 5,009,820, Cl. 264-13.000.
El-Sayed, Lyla M.; and Trout, Torence J., 5,009,980, Cl. 430-114.000.
Friedrich, Wolfgang; and Worsching, Alfred, 5,009,992, Cl. 430-573.000.
Loewe, Erhard, 5,009,372, Cl. 242-71.100.
Pennev, Penio; Rajagopalan, Parthasarathi; and Scribner, Richard M., 5,010,085, Cl. 514-299.000.

Dupro AG: *See—*
Worwag, Peter, 5,008,973, Cl. 15-416.000.

Durbin, Larry L.: *See—*
Burgener, Larry L.; and Durbin, Larry L., 5,009,385, Cl. 248-346.000.

Dusseux, Thierry: *See—*
Rene, Didier; Dusseux, Thierry; and Ginestet, Philippe, 5,010,348, Cl. 343-700.0MS.

Dutzmann, Stefan: *See—*
Kramer, Wolfgang; Weissmuller, Joachim; Berg, Dieter; Brandes, Wilhelm; and Dutzmann, Stefan, 5,010,101, Cl. 514-462.000.

Dyer, Paul N.: *See—*
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E.G.O. Elektro-Gerate Blanc u. Fischer: *See—*
Fischer, Karl; Borst, Gerhard, executor; Treffinger, Heinz, executor; and Fischer, Dorothee, executrix, 5,010,235, Cl. 219-455.000.

E. R. Squibb & Sons, Inc.: *See—*
Aronoff, Marvin S.; Keyes, Denis E.; and Hahn, Robert C., Sr., 5,009,648, Cl. 604-332.000.

East Penn Manufacturing Co., Inc.: *See—*
Spitz, Robert A.; and Bricker, Mark, 5,009,868, Cl. 423-139.000.

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Baldino, Robert L., 5,010,449, Cl. 361-414.000.
Baxter, Carlton J., 5,010,366, Cl. 355-240.000.
Bernstein, Lawrence J., 5,010,410, Cl. 358-214.000.
Coltrain, Bradley K.; Ferrar, Wayne T.; and Landry, Christine J., 5,010,128, Cl. 524-405.000.
Cook, Phillip M.; and Hess, Steven L., 5,010,156, Cl. 527-403.000.
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Matoushek, Robert J.; Fisher, Terrence L.; and Whritenor, James A., 5,009,509, Cl. 346-138.000.
Moberg, Gregory O., 5,010,282, Cl. 318-254.000.
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Bernstrom, Marvin L., 5,009,582, Cl. 418-61.300.
Calviello, Joseph A.; and Hickman, Grayce A., 5,010,036, Cl. 437-173.000.

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Echizen, Hiroshi; and Takaki, Satoshi, to Canon Kabushiki Kaisha. Microwave plasma CVD apparatus with plasma generating chamber constituting a cylindrical cavity resonator. 5,010,276, Cl. 315-111.210.

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Baughman, Ray H.; Buff, Ernest D.; Eckhardt, Helmut; and Fuchs, Gerhard H., 5,009,044, Cl. 52-171.000.

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Wedler, Peter; and Eckmann, Peter, 5,008,989, Cl. 24-641.000.

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Furukawa, Takao, 5,009,060, Cl. 53-512.000.

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Mueller, Otward M.; and Edelstein, William A., 5,010,304, Cl. 330-269.000.

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Braestrup, Claus T.; Nielsen, Mogens C.; Christensen, Joergen A.; Engelstoft, Mogens; Schou, Henning; Eder, Ulrich; Neef, Gunter; Huth, Andreas; Rahtz, Dieter; and Schmiechen, Ralph, 5,010,077, Cl. 514-228.800.

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Fregnan, Giancarlo; Vandoni, Guido; and Torri, Giangiacomo, 5,010,064, Cl. 514-58.000.

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Egami, Noritaka, to Mitsubishi Denki Kabushiki Kaisha. Data transmission apparatus. 5,010,332, Cl. 340-825.500.

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Yamada, Shinjiro; Satoh, Seiki; Mabuchi, Kazuichi; Kitao, Shiei; and Egawa, Yoshiaki, 5,010,264, Cl. 310-72.000.

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Tanaka, Syozo; Takushima, Akiro; Shinobu, Yoshiharu; and Eguchi, Masaki, 5,009,084, Cl. 62-441.000.

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Plath, Peter; Eicken, Karl; Rueb, Lothar; Schwalge, Barbara; Westphalen, Karl-Otto; and Wuerzer, Bruno, 5,009,701, Cl. 71-96.000.

Eide, Dag I.: *See—*
Eide, Geir O.; and Eide, Dag I., 5,009,349, Cl. 224-260.000.

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Yamauchi, Hiroshi; Sugiyama, Isao; Saito, Isao; Nomoto, Seiichiro; Kamiya, Takashi; Machida, Yoshimasa; and Negi, Shigeto, 5,010,188, Cl. 540-222.000.

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Helmer, Ulla K. E.; and Stensio, Karl-Erland M., 5,009,789, Cl. 210-641.000.

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Bonnand, Christian; Mascart, Dominique; and Druelle, Philippe, 5,008,996, Cl. 29-727.000.

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Weinberg, Norman L.; Genders, John D.; and Minklei, Alfred O., 5,009,869, Cl. 423-210.000.

Elfarra, Adnan A., to Wisconsin Alumni Research Foundation. Protection against chemically-induced kidney damage by methimazole. 5,010,092, Cl. 514-359.000.

Eli Lilly and Company: *See—*
Barton, Russell L., 5,010,176, Cl. 530-388.000.

Elias, Samir F.; and Morrison, Daryl K., to Koch Industries, Inc. Petroleum resistant coating and method of preparing same. 5,010,129, Cl. 524-413.000.

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Ellersick, William F., to Raynet Corporation. Inrush current limiting circuit. 5,010,293, Cl. 323-278.000.

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Elsayed-Ali, Hani E., to University of Rochester, The. System for surface temperature measurement with picosecond time resolution. 5,010,250, Cl. 250-310.000.

El-Sayed, Lyla M.; and Trout, Torence J., to Du Pont de Nemours, E. I., and Company. Aromatic nitrogen-containing compounds as adjuvants for electrostatic liquid developers. 5,009,980, Cl. 430-114.000.

EM Diagnostic Systems, Inc.: *See—*
McGeehan, John K., 5,009,994, Cl. 435-4.000.

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Emhart Inc.: *See—*
D'Aquila, Anthony; Smart, Charles F.; and Varian, Raymond H., 5,009,354, Cl. 227-2.000.

Emmert, Ralf; and Weigand, Manfred, to Merck Patent Gesellschaft mit beschrankter Haftung. Golden color luster pigments. 5,009,711, Cl. 106-415.000.

Enari, Hiroyuki; Kumazawa, Satoru; Shimizu, Susumu; Ito, Atsushi; Sato, Nobuo; and Saishoji, Toshihide, to Kureha Kagaku Kogyo Kabushiki Kaishi. Novel azole derivative and agricultural/horticultural fungicide containing said derivative as active ingredient. 5,010,206, Cl. 548-262.200.

Enari, Masahiko; Shikichi, Satoshi; Kawaguchi, Fumiaki; Suzuki, Kenichi; Usui, Masayuki; Matsuoka, Hiroshi; Matsuoka, Kazuhiko; Hosoya, Hideki; Aoki, Akio; and Minoura, Kazuo, to Canon Kabushiki Kaisha. Optical information recording-reproducing apparatus. 5,010,534, Cl. 369-32.000.

Endo, Kenji; and Nagata, Shinichi, to Dainippon Screen Mfg. Co., Ltd. Optical lighting system. 5,010,465, Cl. 362-337.000.

Endo, Mamiko. Pipe liner having electrically conductive wires for hardening and electrostatic build-up prevention. 5,010,440, Cl. 361-215.000.

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Sakuta, Masaharu; Urano, Toshiharu; Tanaka, Kyoichi; Sugiyama, Masashi; Endoh, Shyuzo; and Fujioka, Keisuke, 5,009,713, Cl. 106-727.000.

Energy Sciences Inc.: *See*—
Wyman, John E., 5,009,924, Cl. 427-44.000.

Engel, Klaus: *See*—
Kelkenberg, Heike; Ruback, Wulf; and Engel, Klaus, 5,009,814, Cl. 252-548.000.

Engelhard Corporation: *See*—
Rudy, Wayne M., 5,010,051, Cl. 502-304.000.

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Serbousek, Jon C.; and Engelhardt, John A., 5,009,665, Cl. 623-22.000.

Engelstad, Barry L.; Raymond, Kenneth N.; Huberty, John P.; and White, David L., to University of California, The Regents of the. Imaging agents for in vivo magnetic resonance and scintigraphic imaging. 5,010,191, Cl. 544-225.000.

Engelstoft, Mogens: *See*—
Braestrup, Claus T.; Nielsen, Mogens C.; Christensen, Joergen A.; Engelstoft, Mogens; Schou, Henning; Eder, Ulrich; Neef, Gunter; Huth, Andreas; Rahtz, Dieter; and Schmiechen, Ralph, 5,010,077, Cl. 514-228.800.

Enichem Synthesis S.p.A.: *See*—
Greco, Alberto, 5,010,202, Cl. 548-110.000.

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Robins, Kendall H.; Austin, Dennis K.; and Spraggs, Richard W., 5,009,163, Cl. 102-301.000.

Enzyme Bio-Systems Ltd.: *See*—
Brumm, Phillip J., 5,010,008, Cl. 435-202.000.

EOL, Inc.: *See*—
Hutchinson, Donald P., 5,009,230, Cl. 128-633.000.

Eprova AG: *See*—
Mueller, Hans R.; Ulmann, Martin; Conti, Josef; and Muerdel, Guenter, 5,010,194, Cl. 544-258.000.

Ergan, Francoise; Trani, Michael; and Andre, Gerald, to Canada, Her Majesty the Queen in Right of Canada as represented by the National Research Council of. Lipase immdoilized by cross-linking with inert protein for glyceride synthesis. 5,010,006, Cl. 435-177.000.

Erhardt, Werner, to Siemens Aktiengesellschaft. Break-away element for electrical capacitor. 5,010,442, Cl. 361-275.000.

Erlendsson, Gudni; and Hjaltason, Thorgeir D., to Rite Lite Partnership. Sign plate for illuminated sign. 5,009,019, Cl. 40-541.000.

Ernst Jacobi & Co. KG: *See*—
Steinike, Ulrich, 5,008,972, Cl. 15-312.200.

Esau, LaVerne, to Liberty Diversified Industries, Inc. Fork lift attachment. 5,009,565, Cl. 414-607.000.

Esmon, Charles T.: *See*—
Taylor, Fletcher B., Jr.; and Esmon, Charles T., 5,009,889, Cl. 424-94.640.

Esola, John L.; and Kessler, David L., to M&FC Holding Company, Inc. Pressure regulator. 5,009,245, Cl. 137-116.500.

Esso Resources Canada Limited: *See*—
Schramm, Laurier L.; and Smith, Russell G., 5,009,773, Cl. 208-391.000.

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Estrov, Alexander, to Multisource Technology Corp. Low-profile planar transformer for use in off-line switching power supplies. 5,010,314, Cl. 336-198.000.

ETA SA Fabriques d'Ebauches: *See*—
Perrot, Friedrich, 5,010,532, Cl. 368-88.000.

Ethyl Corporation: *See*—
Balasubramanian, Mannarsamy; and Choudhury, Pranab, 5,010,157, Cl. 528-14.000.
Lam, William Y.; and Liesen, Gregory P., 5,009,802, Cl. 252-48.200.
Niebylski, Leonard M., 5,009,961, Cl. 428-446.000.

Eureka X-Ray Tube, Inc.: *See*—
Thomas, Howard C., 5,010,564, Cl. 378-176.000.

Euroceltique, S.A.: *See*—
Hofer, Peter, 5,010,081, Cl. 514-263.000.

European Atomic Energy Community: *See*—
Heinz, Wilhelm, 5,010,284, Cl. 315-384.000.

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Abu-Isa, Ismat A.; Eusebi, Elio; Jaynes, Craig B.; Moran, Susan C.; and Roy, Michael A., 5,009,827, Cl. 264-156.000.

Evans Automotive, Division of Evans Industries, Inc.: *See*—
Raj, Joseph T., 5,009,938, Cl. 428-31.000.

Evans, Thomas L.; Wasserman, Carol B.; Shea, Timothy J.; and Campbell, John R., to General Electric Company. Method for preparing block polyphenylene ether-polycarbonates. 5,010,143, Cl. 525-394.000.

Everett, Benjamin H., II: *See*—
Iseler, Stanley J.; Beauch, Howard D.; Everett, Benjamin H., II; and Sutorik, John P., 5,009,120, Cl. 74-493.000.

Exxon Production Research Company: *See*—
Leung, Peter K.; Steiger, Ronald P.; and Kunze, Kenneth R., 5,010,301, Cl. 324-376.000.

Exxon Research and Engineering Company: *See*—
Polak, Bob, 5,009,174, Cl. 110-264.000.

Fa. Nattermann Arzneimittel GmbH: *See*—
Schmitt, Hans J.; and Blazek, Vladimir, 5,009,231, Cl. 128-633.000.

Faarup, Peter: *See*—
Gronwald, Frederik; Andersen, Peter H.; Faarup, Peter; Guddal, Erling; Hansen, Kristian T.; Hansen, Louis B.; and Nielsen, Erik B., 5,010,074, Cl. 514-213.000.

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Ponzio, Vittorio, 5,010,334, Cl. 340-870.280.

Falbo, G. P. "Sonny" ; and Harris, Jesse W. Apparatus for and a method of facilitating the excavating and refilling of a trench. 5,009,548, Cl. 405-179.000.

Falk, Kevin L.: *See*—
Holtan, Ramer B., Jr.; Falk, Kevin L.; Bergman, James F.; Smith, James R.; and Nelson, Kenneth E., 5,009,496, Cl. 351-156.000.

Falk, R. A.; Capps, C. D.; and Houk, T. L., to Boeing Company, The. Optical cross bar arithmetic/logic unit. 5,010,505, Cl. 364-713.000.

Faltynek, Mark, to Bagcraft Corporation of America. Window-style bag with integral coupon. 5,009,518, Cl. 383-106.000.

Famili, Amir F.; Marten, F. Lennart; and Mohanty, Dillip K., to Air Products and Chemicals, Inc. Copolymers of vinyl acetate and fluorine-containing acrylate monomers. 5,010,153, Cl. 526-243.000.

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Eichler, Dietrich, 5,009,795, Cl. 210-744.000.

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Piani, Silvano; Tamagnone, Gianfranco; Alpino, Raul R.; Milani, Maria R.; and Fantuz, Marinella, 5,010,063, Cl. 514-56.000.

Fanuc Ltd.: *See*—
Kawamura, Hideaki; Fujibayashi, Kentaro; and Hitaka, Yosato, 5,010,285, Cl. 318-569.000.
Nakamura, Kosei; Kono, Shinichi; Numai, Kazuhisa; and Kimijima, Masami, 5,010,286, Cl. 318-571.000.

Fanuc Ltd: *See*—
Kurakake, Mitsuo; and Kinoshita, Jiro, 5,010,492, Cl. 364-474.290.
Uchida, Hiroyuki, 5,010,266, Cl. 310-156.000.

Faron, Eugene J., II: *See*—
Mauro, David J.; Furcsik, Susan L.; Katz, Frances R.; Faron, Eugene J., II; Gottneid, David J.; and Pustek, Frank J., 5,009,911, Cl. 426-578.000.

Farrell, Jonathon E.; and Anthony, Mark C. Electrical switching mechanism. 5,010,215, Cl. 200-50.00A.

Farrentine, Anselmo N. Dispensing apparatus. 5,009,329, Cl. 221-175.000.

Fathauer, Robert W.: *See*—
Lin, True-Lon; Fathauer, Robert W.; and Grunthaner, Paula J., 5,010,037, Cl. 437-200.000.

Faughn, Jim A., to United States of America, Army. Air distribution connector valve. 5,009,252, Cl. 137-614.040.

Fay, Fredric S.; Fogarty, Kevin E.; and Rodgers, Cyril, to University of Massachusetts Medical Center. Filter accessory for an imaging microspectrofluorimeter. 5,009,488, Cl. 350-315.000.

Federal-Mogul Corporation: *See*—
Nash, Stephen E.; and Pichler, Gerald P., 5,009,434, Cl. 277-1.000.

Fedin, Marat A.; Kuznetsova, Tatyana A.; Lysenkov, Viktor I.; Novikova, Svetlana A.; Savchuk, Valentin A.; Sedelnikov, Anatoly I.; Shabunya, Vera P.; Udarov, Boris G.; Tikhonova, Tatyana S.; Polyakova, Nina P.; and Paklin, Sergei I. Method of sterilizing anthers of plants. 5,010,106, Cl. 514-546.000.

Fedter, Horst; Grunwald, Werner; Nolting, Peter; de la Prieta, Claudio; and Schmid, Kurt, to Robert Bosch GmbH. Thermal radiation sensor. 5,010,315, Cl. 338-7.000.

Fee, Thomas G. Rail mounted rack for bowl-shaped or kettle-shaped containers such as outdoor grills and the like. 5,009,380, Cl. 248-214.000.

Feld, Alexander: *See*—
Karg, Kenneth A.; Hvozda, Carl K.; Neddermeyer, Robert N.; and Feld, Alexander, 5,009,148, Cl. 98-10.000.

Feldman, Marc D.; Skalak, Thomas C.; and Belardinelli, Luiz, to University of Virginia Alumni Patents Foundation, The. Metabolic catheter. 5,009,634, Cl. 604-27.000.

Feldstein, Michael A.: *See*—
Hunter, Gregory H.; Wells, Benjamin A.; and Feldstein, Michael A., 5,009,473, Cl. 350-6.600.

Feldstein, Nathan. Colloidal compositions for electroless deposition. 5,009,965, Cl. 428-546.000.

Felman, Steven W.; Jirkovsky, Ivo L.; and Memoli, Kevin A., to American Home Products Corp. Anti-ulcer 5-(2-substituted ethenyl)-3(2H)-furanones. 5,010,102, Cl. 514-473.000.

Felt, Mildred T.: *See*—
Gilberto, Daniel G., 5,009,132, Cl. 81-57.300.

Fenger, Michael L.; and Vargo, Francis R., to Consolidation Coal Company. Recycling catalyst bed for flue gas treatment. 5,009,856, Cl. 422-178.000.

Fenner, David F.; and Menown, John S. A remotely controllable position indicator system. 5,009,501, Cl. 356-152.000.

Fenton, E. Dale. Trailer and trailer unloading system. 5,009,567, Cl. 414-786.000.

Feranda, Louis, Sr. Propeller guard. 5,009,620, Cl. 440-72.000.

Ferguson, H. William, Jr.: *See*—
Ptaschek, Lawrence; Bowman, James; and Ferguson, H. William, Jr., 5,009,058, Cl. 53-469.000.

Ferrar, Wayne T.: *See*—
Coltrain, Bradley K.; Ferrar, Wayne T.; and Landry, Christine J., 5,010,128, Cl. 524-405.000.

Ferrua, Bernard; and Moulin, Claude, to Compagnie Oris Industrie S.A. Process for the immunological quantitative determination of T_3 and/or T_4 thyroid hormones, using thyroglobulin. 5,010,017, Cl. 436-500.000.

Feser, Rainer: *See*—
Steck, Werner; Marosi, Laszlo; Haberkorn, Herbert; Feser, Rainer; Huebner, Werner; and Jakusch, Helmut, 5,009,877, Cl. 423-607.000.

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Di Nunzio, Vittorio; Giaccardi, Eraldo; and Saluzzo, Sergio, 5,009,213, Cl. 123-620.000.

Fidler, Jerry D.: *See*—
Diekevers, Mark S.; and Fidler, Jerry D., 5,009,017, Cl. 37-142.00A.

Fiege, Helmut: *See*—
Maurer, Fritz; Lantzsch, Reinhard; Fiege, Helmut; and Schnatterer, Albert, 5,010,193, Cl. 544-243.000.

Fifield, John A.; and Kalter, Howard L., to International Business Machines Corporation. Crosstalk-shielded-bit-line dram. 5,010,524, Cl. 365-205.000.

Filla, Deborah S.: *See*—
Lai, John T.; and Filla, Deborah S., 5,010,177, Cl. 534-586.000.

Fink, David M.: *See*—
Allen, Richard C.; Agnew, Marc N.; and Fink, David M., 5,010,083, Cl. 514-292.000.

Finney, Patrick D. Disposable container for storing and dispensing pet food. 5,009,310, Cl. 206-229.000.

Finter, Jurgen; Hilti, Bruno; Mayer, Carl W.; Minder, Ernst; and Pfeifer, Josef, to Ciba-Geigy Corporation. Antistatic and electrically conducting polymers and moulding materials. 5,009,812, Cl. 252-500.000.

Fiorenza, John A., II, to Briggs & Stratton Corporation. Engine speed limiter. 5,009,208, Cl. 123-335.000.

Fiquet, Claire: *See*—
Grollier, Jean-Francois; Fiquet, Claire; Fourcadier, Chantal; Dubief, Claude; and Cauwet, Daniele, 5,009,880, Cl. 424-047.000.

Fischbach, Karl H.: *See*—
Schneider, Alfred; Loos, Horst; and Fischbach, Karl H., 5,009,034, Cl. 49-192.000.

Fischer, Dorothee, executrix: *See*—
Fischer, Karl; Borst, Gerhard, executor; Treffinger, Heinz, executor; and Fischer, Dorothee, executrix, 5,010,235, Cl. 219-455.000.

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Fisher, John M.; and Young, David R., to B. F. Goodrich Company, The. Valve for fluid container. 5,009,249, Cl. 137-495.000.

Fisher, Terrence L.: *See*—
Matoushek, Robert J.; Fisher, Terrence L.; and Whritenor, James A., 5,009,509, Cl. 346-138.000.

Fleischer, Erwin: *See*—
Worschech, Kurt; Wedl, Peter; Fleischer, Erwin; Loeffelholz, Frido; and Jaeckel, Manfred, 5,010,123, Cl. 524-114.000.

Floss Products Corporation: *See*—
Ahmad, Mohammad R.; and Barke, Oscar A., 5,009,886, Cl. 424-58.000.

Fly, Anderson B., to Fly Enterprises, Inc. Weighted membrane structures. 5,009,041, Cl. 52-2.190.

Fly Enterprises, Inc.: *See*—
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FMC Corporation: *See*—
Wolf, Steven D.; Manganaro, James L.; and Miller, Ronald H., 5,009,677, Cl. 55-12.000.

Focke & Co. (GmbH & Co.): *See*—
Focke, Heinz; and Sussenguth, Jurgen, 5,009,322, Cl. 209-536.000.
Focke, Heinz; and Bretthauer, Hans-Jurgen, 5,009,741, Cl. 156-483.000.

Focke, Heinz; and Sussenguth, Jurgen, to Focke & Co. (GmbH & Co.). Process and apparatus for checking/separating out cigarettes. 5,009,322, Cl. 209-536.000.

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Foell, Helmut; and Lehmann, Volker, to Siemens Aktiengesellschaft. Method for topically-resolved determination of the diffusion length of minority charge carriers in a semiconductor crystal body with the assistance of an electrolytic cell. 5,010,294, Cl. 324-158.00D.

Fogarty, Kevin E.: *See*—
Fay, Fredric S.; Fogarty, Kevin E.; and Rodgers, Cyril, 5,009,488, Cl. 350-315.000.

Fogg, Michael W.; Koegel, Keith S.; Shuey, John R.; Zelko, William E.; and Beamenderfer, Robert E., to AMP Incorporated. Shielded cable assembly with floating ground. 5,009,614, Cl. 439-497.000.

Fogg, Michael W.; and Morningstar, Leroy J., to AMP Incorporated. Connector assembly with back shell having vanes. 5,009,616, Cl. 439-608.000.

Folger, Russell F.; and Fox, Gerald P., to Timken Company, The. Double row bearing assembly. 5,009,523, Cl. 384-475.000.

Fomby, K. A. Resilient arm rest. 5,009,468, Cl. 297-412.000.

Fong, Chi-Ming; Chew, Wai-Kwok; and Law, Garry C., to Video Technology Industries, Inc. Electronic educational video system apparatus. 5,009,603, Cl. 434-323.000.

Foothills Diamond Coring (1980) Ltd.: *See*—
Grabinski, Piotr, 5,009,273, Cl. 175-61.000.

Forbes, Hugh O.: *See*—
Goldsmith, Alan; and Forbes, Hugh O., 5,010,551, Cl. 371-16.400.

Ford, David K.: *See*—
Kobylarz, Daniel E.; and Ford, David K., 5,010,570, Cl. 379-390.000.

Forrest, Scott M.: *See*—
Missimer, Dale J.; Fyfe, David T., Jr.; Housman, Joseph J.; and Forrest, Scott M., 5,009,073, Cl. 62-51.100.

Forschungszentrum Julich GmbH: *See*—
Stover, Detlev; Buchkremer, Hans-Peter; and Hecker, Rudolf, 5,009,359, Cl. 228-175.000.

Forsgren, Lyle M.: *See*—
Bankstahl, Herbert A.; Forsgren, Lyle M.; Newman, Neil A.; Beck, Wayne T.; and Griffiths, John M., 5,009,621, Cl. 440-75.000.

Forsvarets Forskningsanstalt: *See*—
Nissborg, Kurt, 5,010,244, Cl. 250-206.100.

Foschaar, William L.: *See*—
Serkes, Jonathan M.; and Foschaar, William L., 5,010,013, Cl. 435-285.000.

Foster, David A., to General Motors Corporation. Easily installed wheel bearing sensor package. 5,010,290, Cl. 324-173.000.

Foster, Francis E.: *See*—
Wilmeth, Thomas S.; Wilmeth, Steven L.; and Foster, Francis E., 5,009,000, Cl. 29-888.020.

Foster, Francis G., to Lever Brothers Company, Division of Conopco Inc. Fabric softening additive for detergent compositions: cellulose ether and organic fabric softener. 5,009,800, Cl. 252-8.900.

Foster, Stephen I.; Stimler, Jeffrey J.; and Nonnemacher, Gail S., to Dow Chemical Company, The. Non-dusting window envelope film utilizing a particulate anti-flecking agent. 5,009,953, Cl. 428-327.000.

Fougerolle, Fabrice: *See*—
Saxod, Michel; and Fougerolle, Fabrice, 5,009,742, Cl. 156-633.000.

Fourcadier, Chantal: *See*—
Grollier, Jean-Francois; Fiquet, Claire; Fourcadier, Chantal; Dubief, Claude; and Cauwet, Daniele, 5,009,880, Cl. 424-047.000.

Fournel, Paul. Versatile structure for all machining work mainly on soft materials. 5,009,255, Cl. 144-1.00R.

Fox, Elizabeth D.; and Schlageter, Alan G., to Xerox Corporation. Grounding brush. 5,010,441, Cl. 361-221.000.

Fox, Gerald P.: *See*—
Folger, Russell F.; and Fox, Gerald P., 5,009,523, Cl. 384-475.000.

Fox, Leslie R.; Wade, Paul C.; and Schmidt, William L., to Digital Equipment Corp. Method of cooling and powering an integrated circuit chip using a compliant interposing pad. 5,010,038, Cl. 437-215.000.

Fraizer, Robert L., to General Motors Corporation. Headlamp assembly. 5,010,458, Cl. 362-80.000.

Frank, Lenore G. R.: *See*—
Nickerson, Mark A.; Poole, John S.; and Frank, Lenore G. R., 5,009,778, Cl. 210-198.200.

Franke, Friedrich H.; and Paersch, Michael J. Process for producing a solid, finely divided fuel based on coal. 5,009,671, Cl. 44-598.000.

Fraser, Donald E., to Hunter Douglas Inc. Method and clip for securing a slat of a venetian blind. 5,009,258, Cl. 160-168.100.

Fregnan, Giancarlo; Vandoni, Guido; and Torri, Giangiacomo, to Edmond Pharma s.r.l. Inclusion complexes of dipyridamole with cyclodextrins. 5,010,064, Cl. 514-58.000.

Freidel, Kenneth; Littleton, L. Arthur; and Freund, William G., to Muirfield Holdings L.P. Method and apparatus for bending glass. 5,009,693, Cl. 65-107.000.

Freitag, Dieter: *See*—
Serini, Volker; Freitag, Dieter; Westeppe, Uwe; Idel, Karsten; Grigo, Ulrich; Casser, Carl; Paetz, Klaus-Christian; and Hajek, Manfred, 5,010,162, Cl. 528-196.000.
Serini, Volker; Freitag, Dieter; Westeppe, Uwe; Idel, Karsten; Grigo, Ulrich; Casser, Carl; Paetz, Klaus-Christian; and Hajek, Manfred, 5,010,163, Cl. 528-196.000.
Westeppe, Uwe; Weymans, Gunther; Grigo, Ulrich; Idel, Karsten-Josef; and Freitag, Dieter, 5,010,147, Cl. 525-462.000.

French, J. Timothy: *See*—
Brazell, David O.; and French, J. Timothy, 5,009,221, Cl. 126-538.000.

Fresenius, AG: *See*—
Keymling, Michael, 5,009,639, Cl. 604-96.000.

Freund, William G.: *See*—
Freidel, Kenneth; Littleton, L. Arthur; and Freund, William G., 5,009,693, Cl. 65-107.000.

Friedrich, Wolfgang; and Worsching, Alfred, to Du Pont de Nemours, E. I., and Company. Photographic silver halide emulsion. 5,009,992, Cl. 430-573.000.

Frielinghaus, Klaus H., to General Signal Corporation. Alternating current immunized relay and method of immunizing a relay to alternating current. 5,010,310, Cl. 335-243.000.

Frijouf, Robert F.: *See*—
Klaassens, J. Ben; Lauw, Hian K.; and de Beer, Freddy, 5,010,471, Cl. 363-160.000.

Fringeli, Werner: *See*—
Jollenbeck, Martin; Berendt, Hans-Ulrich; and Fringeli, Werner, 5,009,669, Cl. 8-573.000.

Frontino, Louis J., to Mars Incorporated. Method and apparatus for variable speed scanning of bar codes. 5,010,242, Cl. 235-467.000.

Fry, John J.; Hall, George R., II; and Smith, Robert A., to Gas Research Institute. Housing for a process controller. 5,010,322, Cl. 340-700.000.

Fuchs, Gerhard H.: *See*—
Baughman, Ray H.; Buff, Ernest D.; Eckhardt, Helmut; and Fuchs, Gerhard H., 5,009,044, Cl. 52-171.000.

Fuji Electric Co., Ltd.: *See*—
Haruki, Hiromu; Kirihata, Fumiaki; and Hashimoto, Osamu, 5,010,384, Cl. 357-38.000.

Fuji, Hiroshi; Fujiwara, Tsuneo; Iwaki, Takashi; Numata, Tomiyuki; Tsuji, Kentaroh; Maeda, Shigemi; Yamaguchi, Takeshi; Kojima, Kunio; Deguchi, Toshihisa; and Terashima, Shigeo, to Sharp Kabushiki Kaisha. Apparatus for recording and reproducing information on and from an optical disk. 5,010,540, Cl. 369-50.000.

Fuji, Hiroshi: *See*—
Terashima, Shigeo; Tsuji, Kentaro; and Fuji, Hiroshi, 5,010,539, Cl. 369-50.000.

Fuji Jukogyo Kabushiki Kaisha: *See*—
Ishii, Norio, 5,009,204, Cl. 123-193.00H.
Morikawa, Koji, 5,009,201, Cl. 123-65.0BA.
Morimoto, Yoshihiko; and Kohno, Tetsushi, 5,009,127, Cl. 74-866.000.
Morimoto, Yoshihiko; and Kohno, Tetsushi, 5,009,129, Cl. 74-866.000.
Ohshita, Saiichiro; and Fukamachi, Kazuhiro, 5,010,488, Cl. 364-424.050.
Takada, Hirohisa, 5,010,289, Cl. 322-8.000.

Fuji Photo Film Co., Ltd.: *See*—
Abe, Akira, 5,009,983, Cl. 430-372.000.
Aoki, Kozo; and Takahashi, Osamu, 5,009,989, Cl. 430-512.000.
Iida, Shinobu; Fujiyama, Masaaki; and Yamada, Keisuke, 5,009,929, Cl. 427-130.000.
Inoue, Noriyuki; and Heki, Tatsuo, 5,009,993, Cl. 430-605.000.
Kato, Eiichi; and Ishii, Kazuo, 5,009,975, Cl. 430-96.000.
Saito, Kenji, 5,010,393, Cl. 358-29.000.
Takayama, Naoto, 5,010,436, Cl. 360-137.000.

Fujibayashi, Kentaro: *See*—
Kawamura, Hideaki; Fujibayashi, Kentaro; and Hitaka, Yosato, 5,010,285, Cl. 318-569.000.

Fujihira, Junichi: *See*—
Hasegawa, Minekazu; Ikeda, Keiichi; and Fujihira, Junichi, 5,009,464, Cl. 296-213.000.

Fujii, Masahiro; Hatakeyama, Masakazu; and Hiraki, Jun, to Chisso Corporation. Method for treating food to control the growth of yeasts. 5,009,907, Cl. 426-335.000.

Fujii, Masao: *See*—
Seshimo, Yuu; and Fujii, Masao, 5,009,263, Cl. 165-151.000.

Fujii, Takao: *See*—
Shioyama, Tsutomu; Minakami, Ko; Fujii, Takao; and Ohtomi, Koichi, 5,009,838, Cl. 376-310.000.

Fujii, Toshifumi: *See*—
Sasaki, Yoshiyuki; Tsunashima, Kenji; Ookuma, Ikuo; and Fujii, Toshifumi, 5,010,404, Cl. 358-139.000.

Fujii, Yoshihalu; and Fujita, Yukitoshi, to Sharp Kabushiki Kaisha. Paper feeding system for a shredder. 5,009,410, Cl. 271-127.000.

Fujikura Ltd.: *See*—
Onodera, Tsutomu; and Yamada, Takeshi, 5,009,513, Cl. 374-31.000.

Fujikura, Masahiro: *See*—
Sakamoto, Hiroaki; Fujikura, Masahiro; and Mukai, Toshio, 5,009,706, Cl. 75-244.000.

Fujimoto, Shusaku: *See*—
Masaki, Shouichi; Fukushima, Akira; Fujimoto, Shusaku; and Nakano, Makoto, 5,010,489, Cl. 364-426.020.

Fujimoto, Yoji: *See*—
Hayashi, Hiroyuki; Seto, Tsuneo; Miura, Hironori; and Fujimoto, Yoji, 5,009,094, Cl. 72-225.000.

Fujioka, Keisuke: *See*—
Sakuta, Masaharu; Urano, Toshiharu; Tanaka, Kyoichi; Sugiyama, Masashi; Endoh, Shyuzo; and Fujioka, Keisuke, 5,009,713, Cl. 106-727.000.

Fujisawa Pharmaceutical Company, Ltd.: *See*—
Sakuta, Masaharu; Urano, Toshiharu; Tanaka, Kyoichi; Sugiyama, Masashi; Endoh, Shyuzo; and Fujioka, Keisuke, 5,009,713, Cl. 106-727.000.
Shiokawa, Youichi; Takimoto, Koichi; and Takenaka, Kohei, 5,010,093, Cl. 514-374.000.

Fujita, Keijiro: *See*—
Sakuma, Shuji; Atsumi, Kiminori; and Fujita, Keijiro, 5,009,898, Cl. 424-618.000.

Fujita, Minoru: *See*—
Fukushima, Yoichi; Fujita, Minoru; Kakinuma, Yuji; and Haga, Toshio, 5,010,243, Cl. 235-488.000.

Fujita, Shingo: *See*—
Wakita, Naohide; Uemura, Tsuyoshi; Ohnishi, Hiroyuki; Ohba, Noriko; Ota, Isao; and Fujita, Shingo, 5,010,327, Cl. 340-784.000.

Fujita, Toshio; Yamashita, Yoshisato; Yoshida, Shigemitsu; and Yamahira, Katsutoshi, to Chisso Corporation. Fertilizer with a degradative coating. 5,009,696, Cl. 71-64.070.

Fujita, Yukitoshi: *See*—
Fujii, Yoshihalu; and Fujita, Yukitoshi, 5,009,410, Cl. 271-127.000.

Fujitsu Limited: *See*—
Kato, Masaaki, 5,010,546, Cl. 370-85.110.
Kinoshita, Kitoshi; and Aoki, Hiroatsu, 5,009,481, Cl. 350-96.180.
Nagakura, Kaoru, 5,010,329, Cl. 340-825.080.

Fujiwara, Tsuneo: *See*—
Fuji, Hiroshi; Fujiwara, Tsuneo; Iwaki, Takashi; Numata, Tomiyuki; Tsuji, Kentaroh; Maeda, Shigemi; Yamaguchi, Takeshi; Kojima, Kunio; Deguchi, Toshihisa; and Terashima, Shigeo, 5,010,540, Cl. 369-50.000.

Fujiyama, Masaaki: *See*—
Iida, Shinobu; Fujiyama, Masaaki; and Yamada, Keisuke, 5,009,929, Cl. 427-130.000.

Fukamachi, Kazuhiro: *See*—
Ohshita, Saiichiro; and Fukamachi, Kazuhiro, 5,010,488, Cl. 364-424.050.

Fukuda, Hisashi, to Oki Electric Industry Co., Ltd. Method of forming an insulating film. 5,009,926, Cl. 427-55.000.

Fukuda, Shin: *See*—
Kawakami, Toshikatsu; Fukuda, Shin; Shinbo, Hiroyasu; Unemura, Toyoaki; Sakamoto, Ken; and Kondo, Tomoji, 5,010,406, Cl. 358-147.000.

Fukui, Tetsuro: *See*—
Mihara, Chieko; Santoh, Tsuyoshi; Sugata, Hiroyuki; and Fukui, Tetsuro, 5,009,987, Cl. 430-495.000.

Fukumochi, Yoji: *See*—
Suzuki, Hitoshi; Shiotani, Shinobu; Tokunaga, Shinji; Hirai, Tokuyuki; Fukumochi, Yoji; Kugimiya, Shuzo; and Sata, Ichiko, 5,010,486, Cl. 364-419.000.

Fukushima, Akira: *See*—
Masaki, Shouichi; Fukushima, Akira; Fujimoto, Shusaku; and Nakano, Makoto, 5,010,489, Cl. 364-426.020.

Fukushima, Hideo; and Kurushima, Masakazu, to Sony Corporation. Rotary head drum apparatus comprising resilient electrical connectors. 5,010,432, Cl. 360-108.000.

Fukushima, Hitoshi: *See*—
Takei, Katsumori; Fukushima, Hitoshi; Iwamoto, Kohei; and Nakamura, Hiroto, 5,010,352, Cl. 346-76.0PH.

Fukushima, Nobuo: *See*—
Sakaegi, Yuji; and Fukushima, Nobuo, 5,010,423, Cl. 360-77.060.

Fukushima, Yoichi; Fujita, Minoru; Kakinuma, Yuji; and Haga, Toshio, to Kyodo Printing Co., Ltd. Method of producing an optical recording card having a hologram contained therein. 5,010,243, Cl. 235-488.000.

Fukutome, Tatsuro: *See*—
Marutake, Yozo; Fukutome, Tatsuro; and Asami, Motomu, 5,010,575, Cl. 381-68.000.

Fuller, George C.; Martin, George R.; Mueller, Richard A.; and Reich, Reuven, to G. D. Searle & Co.; and United States of America, Health and Human Services. Use of heterocyclic amides to inhibit tumor metastasis. 5,010,080, Cl. 514-255.000.

Funabashi, Yuichi: *See*—
Umeda, Itsuki; Takashima, Masaaki; Zama, Yoshiaki; Takemura, Yasuhiko; Funabashi, Yuichi; Watanabe, Junichiro; Takeda, Kiyoshi; and Matsumoto, Makoto, 5,010,137, Cl. 525-104.000.

Funakoshi, Keigo: *See*—
Ametani, Minoru; Funakoshi, Keigo; Kira, Akihiko; Matsushita, Takao; and Shirakura, Keizo, 5,009,735, Cl. 156-241.000.

Funato, Ryo: *See*—
Yoshida, Keiji; Funato, Ryo; Takahiro, Syuji; Kubo, Shinji; and Inagaki, Notoshi, 5,009,978, Cl. 430-109.000.

Furcsik, Susan L.: *See*—
Mauro, David J.; Furcsik, Susan L.; Katz, Frances R.; Faron, Eugene J., II; Gottneid, David J.; and Pustek, Frank J., 5,009,911, Cl. 426-578.000.

Furuichi, Shinji: *See*—
Taguchi, Akira; Morita, Shigetoshi; Taka, Shunichi; Yamada, Hirohide; Takada, Yoshiaki; Furuichi, Shinji; and Ao, Masahiro, 5,010,429, Cl. 360-103.000.

Furukawa Mfg., Co., Ltd.: *See*—
Furukawa, Takao, 5,009,060, Cl. 53-512.000.

Furukawa, Takao, to ECS Corporation; and Furukawa Mfg., Co., Ltd. Vacuum packaging apparatus. 5,009,060, Cl. 53-512.000.

Fuse, Junichi: *See*—
Utsugi, Nobuo; Kihara, Hisashi; Mori, Shuichi; Fuse, Junichi; Miyake, Takashi; and Ikata, Yoshikatsu, 5,010,437, Cl. 360-137.000.

Fussell, David A.: *See*—
van Druff, Albert, Jr.; and Fussell, David A., 5,009,366, Cl. 232-17.000.

Fyfe, David T., Jr.: *See*—
Missimer, Dale J.; Fyfe, David T., Jr.; Housman, Joseph J.; and Forrest, Scott M., 5,009,073, Cl. 62-51.100.

G. D. Searle & Co.: *See*—
Fuller, George C.; Martin, George R.; Mueller, Richard A.; and Reich, Reuven, 5,010,080, Cl. 514-255.000.

Gabel, Dewitt. Zero camber steering suspension. 5,009,447, Cl. 280-661.000.

Gabel, Robert K.: *See*—
Syrinek, Allen R.; Buggs, Ralph N.; and Gabel, Robert K., 5,009,799, Cl. 252-8.553.
Williamson, Charles D.; Allenson, Stephan J.; and Gabel, Robert K., 5,009,267, Cl. 166-271.000.

Gabriele, Valentino, to J. C. Pardo and Sons. Scraper mounting arrangement for food process agitators. 5,009,510, Cl. 366-311.000.

Gabrielsen, Odd S.: *See*—
Gautvik, Kaare M.; Alestrom, Peter; Oven, Tordis B.; and Gabrielsen, Odd S., 5,010,010, Cl. 435-252.300.
Gador, Ardon. Method and apparatus for protection against heat. 5,009,514, Cl. 374-138.000.
Gagnet, Thomas R., to Ingersoll-Rand Company. Compressor unloader controller. 5,009,576, Cl. 417-295.000.
Gagnon, Andre F.: *See*—
Takeuchi, Kenji; Gagnon, Andre F.; Cheung, Augustine C.; and Meyer, Philip E., 5,009,833, Cl. 376-217.000.
Galbi, David: *See*—
Sit, Hon P.; Galbi, David; and Chan, Alfred K., 5,010,508, Cl. 364-748.000.
Galiasso, Roberto; Morales, Alfredo; and Salazar, Jose A., to Intevep, S.A. Hydrocracking high residual contained in vacuum gas oil. 5,009,768, Cl. 208-89.000.
Gallagher, James L.: *See*—
Pyret, Thomas W.; and Gallagher, James L., 5,009,640, Cl. 604-117.000.
Gallenkamp, Bernd: *See*—
Kaufmann, Dieter; and Gallenkamp, Bernd, 5,010,201, Cl. 546-316.000.
Ganesan, Apparajan: *See*—
Hisano, Shinichi; Ganesan, Apparajan; and Guy, Thomas S., 5,010,337, Cl. 341-154.000.
Gansauge, Peter; Kreuter, Volker; and Schettler, Helmut, to International Business Machines Corporation. Integrated circuit substrate with contacts thereon for a packaging structure. 5,010,389, Cl. 357-67.000.
Garber, Eduard A.: *See*—
Lipukhin, Jury V.; Danilov, Leonid I.; Ivoditov, Albert N.; Garber, Eduard A.; Subbotin, Anatoly N.; Pavlov, Valentin P.; Zhukov, Jury K.; and Pimenov, Alexandr F., 5,009,037, Cl. 51-7.000.
Garcia, Rafael A. Digital data and analog radio frequency transmitter. 5,010,585, Cl. 455-118.000.
Garcia, Rod A.: *See*—
Kosin, John A.; Mooney, Gerry; Tarquini, Michael A.; and Garcia, Rod A., 5,009,809, Cl. 252-350.000.
Wason, Satish K.; Mooney, Gerry; Andrews, Claude R.; Tarquini, Michael E.; Kosin, John A.; and Garcia, Rod A., 5,009,810, Cl. 252-350.000.
Gardner, Wallace R.; Goodman, Kenneth R.; Puckett, Robert D.; and Draehn, Ricky L., to Halliburton Logging Services, Inc. Advanced digital telemetry system for monocable transmission featuring multilevel correlative coding and adaptive transversal filter equalizer. 5,010,333, Cl. 340-856.000.
Garg, Diwakar; Mueller, Carl F.; Schaffer, Leslie E.; and Dyer, Paul N. Hard outer coatings deposited on titanium or titanium alloys. 5,009,966, Cl. 428-627.000.
Garriss, Gregory M., to Boeing Company, The. High frequency, low power light source for video camera. 5,010,412, Cl. 358-240.000.
Gas Research Institute: *See*—
Fry, John J.; Hall, George R., II; and Smith, Robert A., 5,010,322, Cl. 340-700.000.
Mahrer, Kenneth D., 5,010,527, Cl. 367-86.000.
Wilkinson, William H., 5,009,086, Cl. 62-476.000.
Gaster, Laramie M.: *See*—
Markwell, Roger E.; Smith, Stephen A.; Hughes, Ian; and Gaster, Laramie M., 5,010,097, Cl. 514-419.000.
Gatan Incorporated: *See*—
Swann, Peter R., 5,009,743, Cl. 156-643.000.
Gatchel, Gary; Newgarden, Joseph E.; and Lynn, Gordon E., to Newgarden, Joseph E. Table tennis ball serving device. 5,009,421, Cl. 273-30.000.
Gatschmann, Klaus G.: *See*—
Schmidt, Ernst; Stehmeier, Heinz; Ruppert, Heinrich W.; Gatschmann, Klaus G.; and Schutze, Gunter, 5,009,237, Cl. 131-70.000.
Gatzemeyer, Dwight L.: *See*—
Sorensen, Joseph A.; and Gatzemeyer, Dwight L., 5,009,134, Cl. 81-487.000.
Gautvik, Kaare M.; Alestrom, Peter; Oven, Tordis B.; and Gabrielsen, Odd S., to Selmer-Sande, A.S. Production of human parathyroid hormone from microorganisms. 5,010,010, Cl. 435-252.300.
Gavet, Louis; Chatelin, Roger; Sotton, Michel; Guigal, Robert; and Laurent, Philippe, to Centre Technique Industriel dit: Institut Textile de France; and Probiotec (SARL). One-use device for biological tests. 5,009,846, Cl. 422-56.000.
Gay, Eddie C.: *See*—
Tomczuk, Zygmunt; Miller, William E.; Wolson, Raymond D.; and Gay, Eddie C., 5,009,752, Cl. 204-64.00R.
Gebhardt, Rolf. Perifusion apparatus for culturing living cells and perifusion culturing process. 5,010,014, Cl. 435-310.000.
Gebr. Happich GmbH: *See*—
Bartkowski, Klaus-Dieter; and Venn, Peter, 5,009,756, Cl. 204-129.350.
GEC Alsthom SA: *See*—
Poline, Pierre, 5,010,288, Cl. 318-811.000.
Gec-Marconi Limited: *See*—
Larner, David J.; and Goodchild, Clive D., 5,010,321, Cl. 340-600.000.
GEE Associates: *See*—
Grossman, M. Gary; and Meisner, Edward H., 5,010,221, Cl. 219-10.55E.
Geeck, Carol A. Shopping container device. 5,009,516, Cl. 383-37.000.
Geffken, Henry P. Self activating keel. 5,009,178, Cl. 114-143.000.
Gehrmann, Bernd; and Treptow, Heinz, to Barmag AG. Method of producing a bulked composite yarn. 5,008,992, Cl. 28-271.000.
Gen, Shokyu: *See*—
Ikada, Yoshito; and Gen, Shokyu, 5,010,145, Cl. 525-415.000.
Genders, John D.: *See*—
Weinberg, Norman L.; Genders, John D.; and Minklei, Alfred O., 5,009,869, Cl. 423-210.000.
Genentech, Inc.: *See*—
Chang, Chung N.; Hitzeman, Ronald A.; and Matteucci, Mark D., 5,010,003, Cl. 435-69.900.
Levinson, Arthur; Simonsen, Christian; and Yelverton, Elizabeth M., 5,010,002, Cl. 435-69.200.
General Dynamics Corporation: *See*—
Johnson, Delwin O., 5,009,104, Cl. 73-597.000.
General Dynamics Corporation, Convair Division: *See*—
Hilal, Mohamed A.; and Parmer, Jerome F., 5,010,255, Cl. 307-106.000.
General Electric CGR S.A.: *See*—
Laurent, Michel; Doukhan, Marc; and Noualhaguet, Pierre, 5,010,563, Cl. 378-132.000.
General Electric Company: *See*—
Bopp, Lawrence H., 5,009,999, Cl. 435-29.000.
Cho, Hyun S., 5,009,673, Cl. 51-293.000.
Desorcie, James L.; and O'Brien, Michael J., 5,010,118, Cl. 522-31.000.
Evans, Thomas L.; Wasserman, Carol B.; Shea, Timothy J.; and Campbell, John R., 5,010,143, Cl. 525-394.000.
Hartley, Richard I.; and Corbett, Peter F., 5,010,511, Cl. 364-786.000.
Lewis, Larry N., 5,010,148, Cl. 525-464.000.
Mueller, Otward M.; and Edelstein, William A., 5,010,304, Cl. 330-269.000.
Phanstiel, Ott, IV; and Brown, Sterling B., 5,010,144, Cl. 525-397.000.
Polasko, Kenneth J.; and Wemple, Ivan L., 5,010,018, Cl. 437-3.000.
Possin, George E.; and Ching-Yeu, Wei, 5,010,027, Cl. 437-41.000.
Richardson, David L.; Clark, Jack P.; Kowdley, Balasubramanian S.; Patterson, Peter M.; Perry, Richard W.; and Smith, Thurman D., 5,009,105, Cl. 73-621.000.
Steele, Douglas S., 5,010,252, Cl. 250-385.100.
Steigerwald, Robert L., 5,010,261, Cl. 307-571.000.
General Hospital Corporation, The: *See*—
Donahoe, Patricia K., 5,010,055, Cl. 514-8.000.
General Instrument Corporation: *See*—
Einthoven, Willem G.; and Mitchell, Muni M., 5,010,023, Cl. 437-8.000.
General Motors Corporation: *See*—
Abu-Isa, Ismat A.; Eusebi, Elio; Jaynes, Craig B.; Moran, Susan C.; and Roy, Michael A., 5,009,827, Cl. 264-156.000.
Abu-Isa, Ismat A., 5,009,955, Cl. 428-401.000.
Charles, Harlan W., 5,009,459, Cl. 296-84.100.
DeLaRosa, Robert L., 5,009,600, Cl. 434-82.000.
Foster, David A., 5,010,290, Cl. 324-173.000.
Fraizer, Robert L., 5,010,458, Cl. 362-80.000.
Ghoneim, Youssef A., 5,009,294, Cl. 192-1.220.
Goubeaux, Ronald J.; and Pettitt, Edward D., 5,009,074, Cl. 62-115.000.
Halstead, Gary A.; and Treloar, Ronald C., 5,009,262, Cl. 165-140.000.
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Katcherian, Ricky V., 5,009,462, Cl. 296-201.000.
Ketterman, Sylvan R., 5,010,453, Cl. 362-61.000.
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Miller, Gregory A., 5,009,452, Cl. 280-730.000.
Ordo, James P.; Raszkowski, James A.; and Klemen, Donald, 5,009,116, Cl. 74-331.000.
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Ostrand, James C., 5,009,392, Cl. 251-180.000.
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Romig, Kenneth L., 5,009,300, Cl. 192-98.000.
Smith-Horn, Garry R.; and Wendt, Robert J., 5,009,461, Cl. 296-146.000.
Smith, Jack E., 5,009,405, Cl. 267-273.000.
Spitler, Wayne L., 5,009,301, Cl. 192-106.200.
VanGorder, David H.; and Wilson, Kenny R., 5,009,066, Cl. 60-415.000.
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Frielinghaus, Klaus H., 5,010,310, Cl. 335-243.000.
Lindsay, William B., 5,010,295, Cl. 324-158.00R.
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Palva, Ilkka, 5,010,000, Cl. 435-69.100.
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Gentry, Scott D.: *See*—
Wallace, William D.; Cutler, Christopher A.; and Gentry, Scott D., 5,009,662, Cl. 606-192.000.
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Dunn, Joseph T., 5,009,888, Cl. 424-94.300.
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Gerson, David, to Printers' Service, Inc. Blanket and roller wash for printing apparatus. 5,009,716, Cl. 134-40.000.
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GFK GmbH: *See*—
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Ghoneim, Youssef A., to General Motors Corporation. Vehicle traction control system. 5,009,294, Cl. 192-1.220.
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Giangano, David A.; Kesselman, Martin; Bocskor, Steven; and Celona, Anthony R., to Grumman Aerospace Corporation. Ultra linear spectroscopic analog-to-digital converter. 5,010,339, Cl. 341-164.000.
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Gilberto, Daniel G., to Grant, Robert A.; Bourque, Douglas A.; and Felt, Mildred T., a part interest. Torque device. 5,009,132, Cl. 81-57.300.
Giles, Gary J., to Dresser Industries, Inc. System to avoid icing in the discharge piping of a pressure relief valve. 5,009,246, Cl. 137-205.500.
Gill, Manzur; and Lin, Sung-Wei, to Texas Instruments Incorporated. Method of making hot electron programmable, tunnel electron erasable contactless EEPROM. 5,010,028, Cl. 437-43.000.
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Suhonen, Christopher H., 5,009,883, Cl. 424-52.000.
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Bodkins, Stanley H., 5,009,334, Cl. 211-54.100.
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Gleaves, John T.: *See*—
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Hahn, Klaus; Guhr, Uwe; Hintz, Hans; Wittenberg, Dietmar; and Gleich, Peter, 5,010,111, Cl. 521-56.000.
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Glockler, Gerhard; Muller, Heinz; Kepplinger, Leopold W.; Matzawrakos, Panajiotis; Koch, Erwin; and Auberger, Heinrich, to Voest-Alpine Industrieanlagenbau GmbH. Plant to be used for metallurgical treatments of metal compounds and/or metal alloys or for producing calcium carbide. 5,009,397, Cl. 266-197.000.
Glomb, Reiner; Maresch, Peter; and Wagner, Ralf, to Th. Kieserling & Albrecht GmbH & Co., Werkzeugmaschinenfabrik. Turning machine. 5,009,136, Cl. 82-127.000.
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Goelzer, Alan R., to Stone & Webster Engineering Corporation. Process for catalytic cracking of hydrocarbons. 5,009,769, Cl. 208-113.000.
Goldberg, Barry A., to Westvaco Corporation. Composite paperboard and polymer package. 5,009,939, Cl. 428-34.200.
Goldfarb, Adolph E.; and Goldfarb, Martin I., to Goldfarb, Adolph E. Surprise action game. 5,009,431, Cl. 273-258.000.
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Goldsmith, Alan; and Forbes, Hugh O., to Xerox Corporation. Self contained troubleshooting aid for declared and non declared machine problems. 5,010,551, Cl. 371-16.400.
Goldsmith, Robert L., to CeraMem Corporation. Cross-flow filtration device with filtrate network and method of forming same. 5,009,781, Cl. 210-247.000.
Gomez, Fernando: *See*—
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Gomi, Takayuki, to Sony Corporation. Process for making bipolar transistor. 5,010,026, Cl. 437-31.000.
Gonda, Hideyuki, to Sanden Corporation. Electromagnetic clutch having a structure for reducing impact noise. 5,009,297, Cl. 192-84.00C.
Goodchild, Clive D.: *See*—
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Goodman, David D.; and Domnitz, Robert, to Inline Connection Corporation. Video transmission and control system utilizing internal telephone lines. 5,010,399, Cl. 358-85.000.
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Goodwin, Brent E.; Karn, Donald L.; and Mistyurik, John D., to Monarch Marking Systems, Inc. Hand-held labeler. 5,009,739, Cl. 156-384.000.
Gordon, Herman B.; Owens, Mark J.; Rubinstein, Leon; and Simpson, Scott, to Rogers Corporation. Flexible circuit connector. 5,009,607, Cl. 439-67.000.
Gordon, Ralph A.: *See*—
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Gordon, Richard A. Tank cover III. 5,009,190, Cl. 119-5.000.
Gordon, Richard A. Circular cat toy. 5,009,193, Cl. 119-29.000.
Gorlitsyn, Nikolai V.: *See*—
Paton, Boris E.; Utkin, Vladimir F.; Nedoseka, Anatoly Y.; Khromyak, Nikolai T.; Gorlitsyn, Nikolai V.; Tikhy, Viktor G.; Mezintsev, Evgeny D.; and Mezhuev, Nikolai N., 5,010,503, Cl. 364-569.000.
Gorski, Jack: *See*—
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Gorthey, Lee A.: *See*—
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Gorton, Lanny A., to Pacesetter Infusion, Ltd. Patient-controlled analgesia security attachment for a medication infusion system. 5,009,641, Cl. 604-131.000.
Gottneid, David J.: *See*—
Mauro, David J.; Furcsik, Susan L.; Katz, Frances R.; Faron, Eugene J., II; Gottneid, David J.; and Pustek, Frank J., 5,009,911, Cl. 426-578.000.
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Gould, John H., to United States of America, Health and Human Services. Quick color test to detect lead release from glaze and enamel coatings. 5,010,020, Cl. 436-77.000.
Goulter, Barbara: *See*—
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Goulter, Victor; and Goulter, Barbara. Expandable banded male urinary incontinence condom and supporting undergarment. 5,009,649, Cl. 604-351.000.
Grabinski, Piotr, to Foothills Diamond Coring (1980) Ltd. Deflection apparatus. 5,009,273, Cl. 175-61.000.
Graham, John A.: *See*—
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Grandjean, Pierre-Andre; and Lee, Philip H. J., to Medtronic, Inc. Steroid eluting intramuscular lead. 5,009,229, Cl. 128-419.00P.
Grange, Kenneth, to Wilkinson Sword Gesellschaft mit beschrankter Haftung. Razor. 5,009,003, Cl. 30-30.000.
Granger, Yves; and Wind, Daniel, to International Business Machines Corporation. Scanner interface for the line adapters of a communication controller. 5,010,548, Cl. 370-95.100.
Grant Airmass Corporation: *See*—
Grant, Benton H., 5,009,579, Cl. 417-413.000.
Grant, Benton H., to Grant Airmass Corporation. Fluid pump encasement. 5,009,579, Cl. 417-413.000.

Grant, Robert A.: *See*—
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Grant TFW: *See*—
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Grard, Guy: *See*—
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Grasdepot, Francois, to Schlumberger Industries. Optical pressure sensor and a method and apparatus for making such a sensor. 5,009,107, Cl. 73-705.000.

Greco, Alberto, to Enichem Synthesis S.p.A. Novel silicon-organic compounds, containing an oxazolidine group. 5,010,202, Cl. 548-110.000.

Green, Paul E., to Rockwell International Corporation. Charge domain successive approximation analog to digital converter. 5,010,340, Cl. 341-172.000.

Greer, James A., to Raytheon Company. Saw device. 5,010,270, Cl. 310-313.00D.

Gregory, Peter-Colin: *See*—
Waldeck, Harald; Benson, Werner; Zeugner, Horst; Wolf, Klaus-Ullrich; Gregory, Peter-Colin; Hamminga, Derk; and van Wijngaarden, Ineke, 5,010,076, Cl. 514-221.000.

Greif, Norbert: *See*—
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Griess, Gary A.: *See*—
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Grigat, Ernst; Meckel, Walter; and Nippe, Burkhard, to Agfa Gevaert Aktiengesellschaft. Process for the production of magnetic recording carriers. 5,009,925, Cl. 427-48.000.

Grigo, Ulrich: *See*—
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Grimm, Noel P.; and Sejvar, James, to Westinghouse Electric Corp. Method for temporary shielding of reactor vessel internals. 5,009,836, Cl. 376-260.000.

Grinberg, Jan; Welkowsky, Murray S.; Wu, Chiung-Sheng; and Braatz, Paul O., to Hughes Aircraft Company. Radiation detector array using radiation sensitive bridges. 5,010,251, Cl. 250-332.000.

Grinberg, Oded, to MNY Holdings and Agencies Limited. Non-penetrating projectile and means therefor. 5,009,164, Cl. 102-502.000.

Grindley, Inc.: *See*—
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Grindley, John R.; and Grindley, Robert M., to Grindley, Inc.; and Robwen, Inc. Fire fighting foam mixing system. 5,009,244, Cl. 137-101.110.

Grindley, Robert M.: *See*—
Grindley, John R.; and Grindley, Robert M., 5,009,244, Cl. 137-101.110.

Grisoni, Bernard F., to Dow Corning France S. A. Silicone foams. 5,010,115, Cl. 521-154.000.

Grob, Ferdinand; Kienzler, Dieter; Linder, Ernst; Potschin, Roger; and Stutzenberger, Heinz, to Robert Bosch GmbH. Apparatus for measuring the particulate matter in the flue gas or exhaust gas from a combustion process. 5,009,064, Cl. 60-276.000.

Grollier, Jean-Francois; Fiquet, Claire; Fourcadier, Chantal; Dubief, Claude; and Cauwet, Daniele, to L'Oreal. Composition and process for the treatment of keratin materials with polymers. 5,009,880, Cl. 424-047.000.

Gronvald, Frederik C.; and Braestrup, Claus, to Novo Nordisk A/S. N-(butenyl substituted) azaheterocyclic carboxylic acids. 5,010,090, Cl. 514-326.000.

Gronwald, Frederik; Andersen, Peter H.; Faarup, Peter; Guddal, Erling; Hansen, Kristian T.; Hansen, Louis B.; and Nielsen, Erik B., to Novo Nordisk A/S. Novel benzazepine derivatives. 5,010,074, Cl. 514-213.000.

Groover, Robert, III, to Texas Instruments Incorporated. Insulator separated vertical CMOS. 5,010,386, Cl. 357-42.000.

Grossman, M. Gary; and Meisner, Edward H., to GEE Associates. Microwaveable coffee makers. 5,010,221, Cl. 219-10.55E.

Gruber, Milan A., to Shook, Ed., Jr. Roofing clamp. 5,009,050, Cl. 52-408.000.

Gruber, Norman G.; and Krauss, Owen T., to Western Atlas International, Inc. Down hole reservoir fluid sampler. 5,009,100, Cl. 73-155.000.

Gruenwald, Heinrich; Ramisch, Hans; and Pawlakowitsch, Anton, to Leybold Aktiengesellschaft. Apparatus for plasma etching. 5,009,738, Cl. 156-345.000.

Grumman Aerospace Corporation: *See*—
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Grunwald, Werner; Holfelder, Gerhard; De La Prieta, Claudio; and Schmid, Kurt, to Robert Bosch GmbH. Printing paste and method of applying said paste. 5,009,708, Cl. 106-105.000.

Grunwald, Werner: *See*—
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GTE Government Systems Corporation: *See*—
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Kim, Tai K.; and Vanderpool, Clarence D., 5,009,788, Cl. 210-639.000.
Reddy, V. Butchi, 5,009,807, Cl. 252-301.40H.
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Guddal, Erling: *See*—
Gronwald, Frederik; Andersen, Peter H.; Faarup, Peter; Guddal, Erling; Hansen, Kristian T.; Hansen, Louis B.; and Nielsen, Erik B., 5,010,074, Cl. 514-213.000.

Gueret, Jean-Louis, to L'Oreal. Piston dispenser for paste or solid products. 5,009,534, Cl. 401-75.000.

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Gugel, Bernd; Kaufmann, Clemens; Kitzberger, Herbert; and Rohrer, Kurt, to Mannesmann Aktiengesellschaft. Matrix print head of hinged-clapper-armature construction. 5,009,529, Cl. 400-124.000.

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Guilbert, Paul A.: *See*—
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Gulf Canada Limited: *See*—
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Gunasekera, Malika; Gunasekera, Sarath P.; Longley, Ross E.; and Burres, Neal S., to Harbor Branch Oceanographic Institution, Inc. Discodermolide compounds, compositions containing same and method of preparation and use. 5,010,099, Cl. 514-459.000.

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Guth, Jean-Louis: *See*—
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Guthrie, Robin J.; Katz, Murray; and Schroll, Craig R., to International Fuel Cells Corporation. Fuel cell end plate structure. 5,009,968, Cl. 429-26.000.

Guy, Thomas S.: *See*—
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Gwozdz, Peter S.: *See*—
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Haerle, Hans A., to Schwaebische Huettenwerke GmbH. Filter for gases. 5,009,857, Cl. 422-180.000.

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Hagelauer, Ulrich, to Storz Medical AG. Apparatus for degassing fluids. 5,009,682, Cl. 55-159.000.

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Hahn, Charles J. Reduced flow bearing. 5,009,522, Cl. 384-288.000.

Hahn, Klaus; Guhr, Uwe; Hintz, Hans; Wittenberg, Dietmar; and Gleich, Peter, to BASF Aktiengesellschaft. Flame resistant, expand-

able styrene polymers and foams, and flame retardants. 5,010,111, Cl. 521-56.000.

Hahn, Robert C., Sr.: *See*—
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Haines & Emerson, Inc.: *See*—
Case, Marvin L.; Sturm, Robert E.; and Herigstad, David P., 5,009,563, Cl. 414-470.000.

Haino, Kozo: *See*—
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Haisma, Jan; Alting, Cornelis L.; and Michielsen, Theodorus M., to U.S. Philips Corporation. Method of manufacturing a semiconductor device. 5,009,689, Cl. 65-33.000.

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Haken, Roger A.: *See*—
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Hall, David E. Load bearing cover and rack for a pick-up truck. 5,009,457, Cl. 296-3.000.

Hall, George R., II: *See*—
Fry, John J.; Hall, George R., II; and Smith, Robert A., 5,010,322, Cl. 340-700.000.

Hall, James T., to Hughes Aircraft Company. Multiple-notch rugate filters and a controlled method of manufacture thereof. 5,009,485, Cl. 350-163.000.

Hallenbach, Werner: *See*—
Lindel, Hans; Hallenbach, Werner; Berschauer, Friedrich; Greife, Heinrich; and Klotz, Gernot, 5,010,091, Cl. 514-357.000.

Halliburton Company: *See*—
Arrington, Stephen T.; and Bradley, Gary W., 5,009,714, Cl. 134-2.000.

Halliburton Logging Services, Inc.: *See*—
Gardner, Wallace R.; Goodman, Kenneth R.; Puckett, Robert D.; and Draehn, Ricky L., 5,010,333, Cl. 340-856.000.

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Olsson, Lars-Inge R.; and Hamacek, Kent F., 5,010,124, Cl. 524-141.000.

Hamada, Emiko: *See*—
Arai, Yuji; Shin, Yuaki; Ishiguro, Takashi; and Hamada, Emiko, 5,009,818, Cl. 264-1.003.

Hamanaka, Naoki: *See*—
Omoda, Koichiro; Tanaka, Teruo; Nakagoshi, Junji; Hamanaka, Naoki; and Nagashima, Shigeo, 5,010,477, Cl. 364-200.000.

Hamano, Hiroyuki, to Canon Kabushiki Kaisha. Zoom lens. 5,009,492, Cl. 350-427.000.

Hamilton, Lowell E.: *See*—
Qamar, Sohail S.; Conard, Harry W.; and Hamilton, Lowell E., 5,009,765, Cl. 204-298.120.

Hamilton, Michael C.; and Bell, John A., to Boeing Company, The. Electro-optical analog-to-digital converter and method for digitizing an analog signal. 5,010,346, Cl. 341-137.000.

Hamlin, Robert N.; Shockey, Rick L.; and Tassel, Robert A. V., to Schneider (USA) Inc. Fiber tip atherectomy catheter. 5,009,659, Cl. 606-159.000.

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Waldeck, Harald; Benson, Werner; Zeugner, Horst; Wolf, Klaus-Ullrich; Gregory, Peter-Colin; Hamminga, Derk; and van Wijngaarden, Ineke, 5,010,076, Cl. 514-221.000.

Hanafusa, Hiroaki: *See*—
Sasaki, Hiroyuki; Shimamura, Masato; Noda, Juichi; Hanafusa, Hiroaki; and Takeuchi, Yoshiaki, 5,009,478, Cl. 350-96.150.

Hanai, Kazumichi; Mine, Koichi; and Kikuta, Hikaru, to Aisan Kogyo Kabushiki Kaisha. Vapor lock preventing mechanism in motor-driven fuel pump. 5,009,575, Cl. 417-244.000.

Hanaoka, Motoyoshi: *See*—
Yamanaka, Masahiko; Hanaoka, Motoyoshi; Konse, Hiroaki; Shigeno, Haruhisa; and Kinoshita, Masakatsu, 5,009,936, Cl. 427-407.100.

Hanawa, Akinori: *See*—
Tanaka, Kazuyuki; Iwami, Etsuji; Matsuzawa, Jun; Mukoyama, Yoshiyuki; Shibata, Noriohiko; Hanawa, Akinori; and Yokota, Mitsuo, 5,009,949, Cl. 428-260.000.

Handler, Vivian M. Sheet-material dispensing box. 5,009,351, Cl. 225-52.000.

Handley, Dean A.; Houlihan, William J.; and Weinstein, David B., to Sandoz Pharmaceuticals Corp. Triglyceride-water emulsion pharmaceutical vehicles. 5,010,067, Cl. 514-75.000.

Hane, Motomu: *See*—
Hirose, Sachio; Hane, Motomu; and Inagawa, Masanobu, 5,010,174, Cl. 530-307.000.

Hanerus, Goran; and Ljungstrom, Tommy, to Tetra Pak Holdings & Finance S.A. Method of and an apparatus for venting a filling plant. 5,009,339, Cl. 222-1.000.

Haney, Ronald J.: *See*—
Ruder, Carl J.; Haney, Ronald J.; Chutorash, Richard J.; Bostad, Wayne W.; Zweig, Arnold A.; and Payne, Lyle B., 5,009,560, Cl. 414-392.000.

Hansa Metallwerke AG: *See*—
Oberdorfer, Hans, 5,009,247, Cl. 137-218.000.

Hansen, Bernd. Double chamber receptacle. 5,009,309, Cl. 206-219.000.

Hansen, Joseph M.: *See*—
Scheller, Clifford D.; Collins, Aaron A.; and Hansen, Joseph M., 5,010,553, Cl. 371-35.000.

Hansen, Kristian T.: *See*—
Gronwald, Frederik; Andersen, Peter H.; Faarup, Peter; Guddal, Erling; Hansen, Kristian T.; Hansen, Louis B.; and Nielsen, Erik B., 5,010,074, Cl. 514-213.000.

Hansen, Louis B.: *See*—
Gronwald, Frederik; Andersen, Peter H.; Faarup, Peter; Guddal, Erling; Hansen, Kristian T.; Hansen, Louis B.; and Nielsen, Erik B., 5,010,074, Cl. 514-213.000.

Hansen, Reimer Z.: *See*—
Clarke, Neville; and Hansen, Reimer Z., 5,009,784, Cl. 210-512.100.

Hanyu, Masaaki; and Ozaki, Yukio, to Pioneer Electronic Corporation. Television projector for projection display. 5,010,396, Cl. 358-60.000.

Harada, Kinji; Ikeda, Kyoichi; Kuwayama, Hideki; Kobayashi, Takashi; Nishikawa, Tadashi; Watanabe, Tetsuya; and Yoshida, Takashi, to Yokogawa Electric Corporation. Vibrating type transducer. 5,009,108, Cl. 73-704.000.

Harada, Kyouji; Kato, Eiji; Sakaguchi, Yoshikazu; Watanabe, Suzuaki; and Hoshino, Akira, to Aisin-AW Kabushiki Kaisha; and Toyota Jidosha Kabushiki Kaisha. Multi-disk brake for automatic transmission. 5,009,290, Cl. 188-71.500.

Harandi, Mohsen N.; and Owen, Hartley, to Mobil Oil Corporation. Extraction and reactor system. 5,009,859, Cl. 422-189.000.

Harano, Takeshi; Takaki, Satoru; Shigesato, Yuzo; Suzuki, Koichi; Hashimoto, Naoki; Kojima, Hiroyasu; and Oyama, Takuji, to Ashahi Glass Company, Ltd. Method of forming a transparent conductive film. 5,009,922, Cl. 427-37.000.

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Gunasekera, Malika; Gunasekera, Sarath P.; Longley, Ross E.; and Burres, Neal S., 5,010,099, Cl. 514-459.000.

Hardiman, Christopher J., to Monsanto Company. Stabilized metal drier. 5,010,154, Cl. 526-135.000.

Hardin, Paul W., Jr.; and Taylor, Wayne. Traffic barrier gate. 5,009,542, Cl. 404-6.000.

Hardy, Sidney D.: *See*—
McAuliffe, Lawrence, Jr.; and Hardy, Sidney D., 5,009,390, Cl. 251-129.200.

Harper-Wyman Company: *See*—
Massey, Dale A., 5,009,393, Cl. 251-207.000.

Harpold, John G.: *See*—
Siefkes, Jerry D.; Harpold, John G.; and Schatz, Douglas S., 5,009,764, Cl. 204-298.080.

Harrier GmbH Gesellschaft fur den Vertrieb medizinischer und technischer Gerate: *See*—
Krebser, Werner; Lantos, Michael; and Kolta, Peter, 5,010,452, Cl. 362-19.000.

Harris Corporation: *See*—
Beasom, James D., 5,010,377, Cl. 357-22.000.
Yost, Richard A.; and Damerow, David H., 5,010,558, Cl. 375-37.000.

Harris, Jesse W.: *See*—
Falbo, G. P. "Sonny" ; and Harris, Jesse W., 5,009,548, Cl. 405-179.000.

Harris Research Inc.: *See*—
Beck, Boyd R.; and Harris, Robert D., 5,009,667, Cl. 8-115.560.

Harris, Robert D.: *See*—
Beck, Boyd R.; and Harris, Robert D., 5,009,667, Cl. 8-115.560.

Harth, Arthur; Dowbrowski, Adrian T.; and Williams, Bernard O. Gameboard amusement device. 5,009,424, Cl. 273-85.00D.

Hartley, Richard I.; and Corbett, Peter F., to General Electric Company. Digit-serial linear combining apparatus useful in dividers. 5,010,511, Cl. 364-786.000.

Hartman, Pamela J.: *See*—
Hawkins, William G.; Burke, Cathie J.; Roll, Daniel O.; Hartman, Pamela J.; and Atkinson, Diane, 5,010,355, Cl. 346-140.00R.

Hartmann, Heinrich: *See*—
Hennig, Karl; Hartmann, Heinrich; and Raubenheimer, Hans-Juergen, 5,010,150, Cl. 526-88.000.
Martischius, Franz-Dieter; Vogel, Hans-Henning; Greif, Norbert; Oppenlaender, Knut; Denzinger, Walter; and Hartmann, Heinrich, 5,009,670, Cl. 44-385.000.
Perner, Johannes; Diessel, Paul; Hartmann, Heinrich; Denzinger, Walter; Oftring, Alfred; and Schoenleben, Willibald, 5,009,805, Cl. 252-174.240.

Hartstein, Allan M.; and Koch, Roger H., to International Business Machines Corp. Neural network having an associative memory that learns by example. 5,010,512, Cl. 364-807.000.

Haruki, Hiromu; Kirihata, Fumiaki; and Hashimoto, Osamu, to Fuji Electric Co., Ltd. Gate turn-off thyristor with resistance layers. 5,010,384, Cl. 357-38.000.

Harvest Chemicals (Proprietary) Limited: *See*—
Bewsey, John A., 5,009,710, Cl. 106-208.000.

Harvey, Karen N.: *See*—
Mowforth, Clive W.; Bullock, James F.; Maternaghan, Trevor J.; and Harvey, Karen N., 5,009,991, Cl. 430-567.000.

Harvey, N. Thatcher: *See*—
Eilert, Randall N.; Neel, Robert M.; Harvey, N. Thatcher; Ames, Wilbur R., IV; and Lord, Randall D., 5,008,974, Cl. 16-114.00R.
Hasegawa, Jun: *See*—
Ishida, Tokuji; Norita, Toshio; and Hasegawa, Jun, 5,010,409, Cl. 358-213.190.
Hasegawa, Masahide; Otokawa, Mitsuhiro; Matsuoka, Hidetoshi; and Hirata, Noritsugu, to Canon Kabushiki Kaisha. Recording apparatus for an information signal with a plural kinds of pilot signals using a plurality of heads. 5,010,424, Cl. 360-77.140.
Hasegawa, Minekazu; Ikeda, Keiichi; and Fujihira, Junichi, to Kinugawa Rubber Industrial Co., Ltd. Structure for draining liquid for a vehicle and method for forming the structure. 5,009,464, Cl. 296-213.000.
Hasegawa, Shinichi, to Pioneer Electronic Corporation. Triple tube type projection television. 5,010,397, Cl. 358-60.000.
Hasegawa, Takanori; Abe, Nobuyuki; Hibara, Toru; Hirose, Toshihiko; Kanda, Takashi; Saito, Hiroshi; Oshima, Masaki; and Nakazawa, Eiji, to Riso Kagaku Corporation; and Nippon Seimitsu Kogyo Kabushiki Kaisha. Image processing apparatus. 5,010,420, Cl. 358-471.000.
Hashimoto Corporation: *See*—
Hashimoto, Kazuo, 5,010,422, Cl. 360-69.000.
Hashimoto Forming Industry Co., Ltd.: *See*—
Iwata, Takao; and Hotta, Tetsuo, 5,009,460, Cl. 296-93.000.
Hashimoto, Kazuo, to Hashimoto Corporation. Driving system for endless video tape by one-touch timer. 5,010,422, Cl. 360-69.000.
Hashimoto, Mikio: *See*—
Kohsaka, Masaki; Higashi, Isaburou; Akana, Yoshinori; Hashimoto, Mikio; and Yatsu, Tadao, 5,010,146, Cl. 525-439.000.
Hashimoto, Naoki: *See*—
Harano, Takeshi; Takaki, Satoru; Shigesato, Yuzo; Suzuki, Koichi; Hashimoto, Naoki; Kojima, Hiroyasu; and Oyama, Takuji, 5,009,922, Cl. 427-37.000.
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Haruki, Hiromu; Kirihata, Fumiaki; and Hashimoto, Osamu, 5,010,384, Cl. 357-38.000.
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Abe, Ryoji; Okita, Junichi; Miyagoshi, Katsunobu; and Hashiyama, Kouichi, 5,009,205, Cl. 123-195.00H.
Haskel, Inc.: *See*—
Kelly, John W., 5,009,002, Cl. 29-890.031.
Hassler, Dietrich; and Schmidt, Erhard, to Siemens Aktiengesellschaft. Extracorporeal lithotripsy apparatus using high intensity shock waves for calculus disintegration and low intensity shock waves for imaging. 5,009,232, Cl. 128-660.030.
Hata, Kazuyoshi, to Minolta Camera Kabushiki Kaisha. Compact zoom lens system. 5,009,491, Cl. 350-427.000.
Hatakenaka, Tetsuo: *See*—
Kaneko, Toshimi; Morinaga, Tetsuya; and Hatakenaka, Tetsuo, 5,010,313, Cl. 335-296.000.
Hatakeyama, Katsunori: *See*—
Moriwaki, Masafumi; Sano, Shigeaki; Hatakeyama, Katsunori; Yamada, Hiroshi; and Nouno, Youzou, 5,010,213, Cl. 178-18.000.
Hatakeyama, Masakazu: *See*—
Fujii, Masahiro; Hatakeyama, Masakazu; and Hiraki, Jun, 5,009,907, Cl. 426-335.000.
Hatanaka, Sunao, to Alps Electric Co., Ltd. Electrophotographic apparatus having positioning mechanism for detachable process cartridge. 5,010,365, Cl. 355-211.000.
Hatano, Hideki: *See*—
Kouno, Tomomitsu; Hatano, Hideki; Yamaji, Takashi; Ootaki, Sakashi; and Nishida, Masami, 5,009,490, Cl. 350-342.000.
Hatomoto, Isamu; and Matsuo, Yoshiteru, to Kuraray Company Limited; and Honda Giken Kogyo Kabushiki Kaisha. Composite sheet for automotive use. 5,009,946, Cl. 428-87.000.
Hattori, Akio: *See*—
Machida, Satoshi; and Hattori, Akio, 5,009,125, Cl. 74-606.00R.
Hattori, Chikamasa: *See*—
Kameyama, Fumio; and Hattori, Chikamasa, 5,009,554, Cl. 409-231.000.
Hawkins, William G.; Burke, Cathie J.; Roll, Daniel O.; Hartman, Pamela J.; and Atkinson, Diane, to Xerox Corporation. Ink jet printhead having ionic passivation of electrical circuitry. 5,010,355, Cl. 346-140.00R.
Haws Company: *See*—
Stein, Matthew I., 5,008,963, Cl. 4-620.000.
Hayakawa, Takeshi; Narikawa, Shiro; Ohashi, Kunio; and Tsujimoto, Yoshiharu, to Sharp Kabushiki Kaisha. Photosensitive member for electrophotography having amorphous silicon. 5,009,977, Cl. 430-84.000.
Hayase, Isao; and Tejima, Kunisuke, to Hitachi, Ltd. Rotary compressor of variable displacement type. 5,009,577, Cl. 417-295.000.
Hayashi, Hiroshige: *See*—
Naganuma, Hiroshi; Sato, Kenji; Yamamoto, Masashi; Kubota, Toshiaki; Hayashi, Hiroshige; and Ishizaka, Yoshirou, 5,009,080, Cl. 62-256.000.
Hayashi, Hiroyuki; Seto, Tsuneo; Miura, Hironori; and Fujimoto, Yoji, to Kawasaki Steel Corporation. Method of rolling H-shaped steels. 5,009,094, Cl. 72-225.000.
Hayashi, Tetsuo: *See*—
Okumoto, Takaharu; Hayashida, Tadashi; Kawada, Kazuo; and Hayashi, Tetsuo, 5,009,423, Cl. 273-80.200.
Hayashi, Tstsuya: *See*—
Okumoto, Takaharu; Ninomiya, Toshio; and Hayashi, Tstsuya, 5,009,425, Cl. 273-167.00R.
Hayashi, Yasuyuki; and Abe, Shigenobu, to Kabushiki Kaisha Showa Seisakusho. Shock absorber for use in a vehicle. 5,009,451, Cl. 280-724.000.
Hayashi, Yutaka; Itoh, Atuo; Imai, Mizuho; and Iida, Hideyo, to Japan as represented by general director of Agency of Industrial Science and Technology; Taiyo Yuden Co., Ltd.; and Research Development Corporation of Japan. Method for forming a transparent conductive metal oxide film. 5,009,928, Cl. 427-126.300.
Hayashida, Tadashi: *See*—
Okumoto, Takaharu; Hayashida, Tadashi; Kawada, Kazuo; and Hayashi, Tetsuo, 5,009,423, Cl. 273-80.200.
Hayden, James D.: *See*—
Pfiester, James R.; and Hayden, James D., 5,010,030, Cl. 437-192.000.
Hayes, Ann G.; and Birch, Phillip J., to Glaxo Group Limited. Method of protecting mammals against neuronal damage resulting from cerebral ischemia. 5,010,096, Cl. 514-411.000.
Hayes, Philip A.: *See*—
Barrios, Richard C.; and Hayes, Philip A., 5,008,967, Cl. 14-7.000.
Hays, Dan A., to Xerox Corporation. Dual AC development system for controlling the spacing of a toner cloud. 5,010,367, Cl. 355-247.000.
Hazawa, Osamu, to NEC Corporation. Consistency ensuring system for the contents of a cache memory. 5,010,475, Cl. 364-200.000.
HBOG-Oil Sands Limited Partnership: *See*—
Schramm, Laurier L.; and Smith, Russell G., 5,009,773, Cl. 208-391.000.
Hebert, Alfred M. Magnetic element with magnesium coil for filter. 5,009,779, Cl. 210-223.000.
Hecker, Rudolf: *See*—
Stover, Detlev; Buchkremer, Hans-Peter; and Hecker, Rudolf, 5,009,359, Cl. 228-175.000.
Hector, Francis N., Jr.: *See*—
Hector, Francis N., Sr.; and Hector, Francis N., Jr., 5,009,569, Cl. 415-4.100.
Hector, Francis N., Sr.; and Hector, Francis N., Jr. Wind energy collection system. 5,009,569, Cl. 415-4.100.
Hed, Aharon Z., to International Superconductor Corp. Electronic modulation of magnetic fields. 5,010,311, Cl. 335-216.000.
Heidelberger Druckmaschinen AG: *See*—
Wirz, Arno, 5,009,161, Cl. 101-425.000.
Heidt, Thomas; and Wickstead, James C., to Wickstead, James C. Apparatus for storing video signals on audio cassette. 5,010,419, Cl. 358-335.000.
Heilporn, Marc: *See*—
Prieels, Jean-Paul; Maschelein, Charles; and Heilporn, Marc, 5,010,807, Cl. 435-190.000.
Heimala, Seppo O.; Hyvarinen, Olli V. J.; and Metsarinta, Maija-Leena, to Outokumpu Oy. Method for removing sulphur and nitrogen compounds from gas. 5,009,870, Cl. 423-239.000.
Heinemann, Hans-Joachim: *See*—
Palm, Gangolf; Lehmann, Karl-Heinz; and Heinemann, Hans-Joachim, 5,008,979, Cl. 19-97.000.
Heins, Ralph C. Portable cleat. 5,008,983, Cl. 24-131.00C.
Heinz, Wilhelm, to European Atomic Energy Community. Device for the optical recording of rapid processes with a TV camera. 5,010,284, Cl. 315-384.000.
Heitmann, Uwe, to Korber AG. Apparatus for supplying fibrous material to machines for simultaneously producing a plurality of cigarette rods. 5,009,238, Cl. 131-108.000.
Heki, Tatsuo: *See*—
Inoue, Noriyuki; and Heki, Tatsuo, 5,009,993, Cl. 430-605.000.
Helbig, Peter: *See*—
Eckhardt, Fritz; Helbig, Peter; and Schoenherr, Walter, 5,010,272, Cl. 313-579.000.
Hellergvist, Carl G., to Vanderbilt University. Therapeutic agent and method of inhibiting vascularization of tumors. 5,010,062, Cl. 514-54.000.
Helmer, Ulla K. E.; and Stensio, Karl-Erland M., to EKA Nobel. Method and plant for separation of synthetic water soluble polymers. 5,009,789, Cl. 210-641.000.
Hemming, Valda K. Nursing garment. 5,008,960, Cl. 2-104.000.
Hendrickson, Alfred A.; and Smith, Darrell W., to Michigan Technological University, Board of Control of. Method of making high strength articles from forged powder steel alloys. 5,009,842, Cl. 419-28.000.
Henke, Reinhold: *See*—
Werdin, David A.; and Henke, Reinhold, 5,010,450, Cl. 361-415.000.
Hennig, Karl; Hartmann, Heinrich; and Raubenheimer, Hans-Juergen, to BASF Aktiengesellschaft. Controlling the particle size in the preparation of polymer powders. 5,010,150, Cl. 526-88.000.
Henning, Rolf; Benz, Gunter; Stasch, Johannes-Peter; Knorr, Andreas; and Bender, Wolfgang, to Bayer Aktiengesellschaft. Renin-inhibiting peptides having an aminomethyl side chain. 5,010,057, Cl. 514-018.000.
Hennings, Detlev F. K.; and Schreinemacher, Herbert J., to U.S. Philips Corp. Method of manufacturing barium titanate $BaTiO_3$. 5,009,876, Cl. 423-598.000.
Henschen, Homer E.; McKee, Michael J.; and Pawlikowski, Joseph M., to AMP Incorporated. Self regulating temperature heater as an integral part of a printed circuit board. 5,010,233, Cl. 219-209.000.
Hensley, Albert L., Jr.: *See*—
Clark, Frederick T.; Hensley, Albert L., Jr.; Lyzinski, David; and Peck, Lawrence B., 5,009,771, Cl. 208-216.0PP.
Miller, Jeffrey T.; and Hensley, Albert L., Jr., 5,009,770, Cl. 208-209.000.

Henttinen, Kauko: *See*—
Maenpaa, Matti; Lehtoluoma, Teuvo; Henttinen, Kauko; Jokipalo, Pertti; Saren, Aimo; and Pirinen, Seppo, 5,009,096, Cl. 72-239.000.
Her Majesty the Queen in right of the Province of Alberta: *See*—
Schramm, Laurier L.; and Smith, Russell G., 5,009,773, Cl. 208-391.000.
Her, Ming-Long. Diving case massager. 5,009,222, Cl. 128-36.000.
Herberg, Gerhard; Hoffmann, Hans-Jurgen; Gesenhues, Ludger; Huang, Zhen; and Hoscher, Reinhard, to August Bilstein GmbH & Co. KG. Vibration-absorber sensor for a semi-actively controlled chasis with a relative-velocity sensor and with electronics for processing their outputs. 5,009,450, Cl. 280-707.000.
Hergenrother, Paul M.; and Connell, John W., to United States of America, National Aeronautics and Space Administration. Polyphenylquinoxalines via aromatic nucleophilic displacement. 5,010,197, Cl. 544-353.000.
Herigstad, David P.: *See*—
Case, Marvin L.; Sturm, Robert E.; and Herigstad, David P., 5,009,563, Cl. 414-470.000.
Herman Miller, Inc.: *See*—
Kurrasch, Andrew J., 5,009,043, Cl. 52-145.000.
Hermanson, Fredrik, to Bengt Henningson. Tool holder for tools on a perforated board. 5,009,381, Cl. 248-221.100.
Hermeling, Dieter; Becker, Rainer; and Dobler, Walter, to BASF Aktiengesellschaft. Preparation of dihydroxydiones. 5,009,753, Cl. 204-75.000.
Hernandez, Francisco; and Chamberlain, Jerry, to Siemens Medical Laboratories, Inc. Apparatus and method for inhibiting the generation of excessive radiation. 5,010,562, Cl. 378-125.000.
Herold, Peter; and Angst, Christof, to Ciba-Geigy Corporation. Processes for the preparation of 5-amino-4-hydroxy-valeric acid derivatives. 5,010,189, Cl. 544-174.000.
Herrington, Ronald M.; Turner, Robert B.; and Matijega, Roney J., to Dow Chemical Company. Flexible polyurethane foams prepared using low unsaturation polyether polyols. 5,010,117, Cl. 521-159.000.
Hess, Steven L.: *See*—
Cook, Phillip M.; and Hess, Steven L., 5,010,156, Cl. 527-403.000.
Hessel, Stephen R.: *See*—
Pike, Kelly A.; and Hessel, Stephen R., 5,009,251, Cl. 137-601.000.
Hester, Troy I., to United States of America, Army. Device and method for detecting and displaying crossover pattern in precision winding. 5,009,373, Cl. 242-158.00R.
Hesterberg, William G.: *See*—
Cleary, Terrance M.; Donahue, Raymond J.; Hesterberg, William G.; and Toriello, Lawrence I., 5,009,260, Cl. 164-255.000.
Heuling, Ulrich S. Process and apparatus for harvesting of crops from stalks and chopping the stalks. 5,009,061, Cl. 56-104.000.
Heuvelsland, Albert J., to Dow Chemical Company. Production of polyether polyols with reduced unsaturation. 5,010,187, Cl. 536-120.000.
Hewlett-Packard Company: *See*—
Butterworth, Mark M., 5,010,241, Cl. 235-462.000.
Cowger, Bruce; Dion, John H.; and Peters, William E., 5,010,354, Cl. 346-140.00R.
Davis, Mark L., 5,010,535, Cl. 369-32.000.
Diebel, Heinz; Peterhoff, Ralf; and Thuemling, Evelyn, 5,010,502, Cl. 364-522.000.
Eilert, Randall N.; Neel, Robert M.; Harvey, N. Thatcher; Ames, Wilbur R., IV; and Lord, Randall D., 5,008,974, Cl. 16-114.00R.
Nickerson, Mark A.; Poole, John S.; and Frank, Lenore G. R., 5,009,778, Cl. 210-198.200.
Vincent, Kent D.; and Jamp, Rueiming, 5,010,580, Cl. 382-17.000.
Wanger, Mark E.; Methlie, Jennifer L.; Christie, Leslie G.; Dauner, Daniel R.; Domel, Douglas R.; Jones, David P.; Oliver, Thomas C.; and Stavely, Donald J., 5,010,536, Cl. 369-36.000.
Hexcel Corporation: *See*—
Cloyd, Willard C.; and Nelson, Robert M., 5,009,927, Cl. 427-121.000.
Hi-Tek Polymers, Inc.: *See*—
Miller, Gary A., 5,009,969, Cl. 424-59.000.
Hibara, Toru: *See*—
Hasegawa, Takanori; Abe, Nobuyuki; Hibara, Toru; Hirose, Toshihiko; Kanda, Takashi; Saito, Hiroshi; Oshima, Masaki; and Nakazawa, Eiji, 5,010,420, Cl. 358-471.000.
Hickman, Grayce A.: *See*—
Calviello, Joseph A.; and Hickman, Grayce A., 5,010,036, Cl. 437-173.000.
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Higashio, Kimihiko; and Yoshikai, Takeshi, to Minolta Camera Kabushiki Kaisha. Image forming apparatus having sheet jam reaction reset means. 5,010,363, Cl. 355-206.000.
High Technologies, Inc.: *See*—
Ahmad, Jameel; and Valenza, Joseph P., 5,009,543, Cl. 404-70.000.
Higuchi, Naoshige; and Miyake, Toru, to Dai Nippon Printing Co., Ltd. Blank plates for forming multi-color fluorescent planes and methods for forming multi-color fluorescent planes. 5,009,972, Cl. 430-7.000.
Higuchi, Nariyoshi; Yamagishi, Miki; and Miyachi, Tsuneharu, to Nippon Kokan Kabushiki Kaisha. Method of removing mercury in exhaust gases from a waster incinerator. 5,009,871, Cl. 423-240.000.
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Hikita, Mitsutaka; Sumioka, Atsushi; Tabuchi, Toyoji; Kurosawa, Kazuhito; and Kinoshita, Tuneo, to Hitachi, Ltd.; Hitachi Denshi Kabushiki Kaisha; and Hitachi Communication System, Inc. SAW resonator having a broad bandwidth. 5,010,269, Cl. 310-313.00B.
Hilal, Mohamed A.; and Parmer, Jerome F., to General Dynamics Corporation, Convair Division. High current magnetohydrodynamic gigawatt pulse generator. 5,010,255, Cl. 307-106.000.
Hilbish, Brian K.; Leonard, David W., Sr.; Burgess, Arnold C.; and Burns, David R., to Simplimatic Engineering Company. Article handling device with low profile side guides. 5,009,550, Cl. 406-87.000.
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Manschitz, Erwin, 5,009,440, Cl. 279-71.000.
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Finter, Jurgen; Hilti, Bruno; Mayer, Carl W.; Minder, Ernst; and Pfeifer, Josef, 5,009,812, Cl. 252-500.000.
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Hinterman, William H.; and Hinterman, Timothy W., 5,009,091, Cl. 72-21.000.
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Shirai, Tadayoshi; and Hioki, Masahito, 5,009,538, Cl. 403-134.000.
Hipple Cancer Research Corporation: *See*—
Murphy, Martin J., Jr.; Stubbs, Jack B.; and Leonard, Thomas A., 5,009,503, Cl. 356-339.000.
Hirai, Tokuyuki: *See*—
Suzuki, Hitoshi; Shiotani, Shinobu; Tokunaga, Shinji; Hirai, Tokuyuki; Fukumochi, Yoji; Kugimiya, Shuzo; and Sata, Ichiko, 5,010,486, Cl. 364-419.000.
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Fujii, Masahiro; Hatakeyama, Masakazu; and Hiraki, Jun, 5,009,907, Cl. 426-335.000.
Hirano, Motoki: *See*—
Mizuno, Tsuyoshi; and Hirano, Motoki, 5,010,349, Cl. 343-700.0MS.
Hirano, Yoshinao; Sato, Katsumo; Nagamori, Shigeru; Murata, Katsuhide; Horikiri, Kazuhito; and Shirai, Junji, to Mitsui Engineering & Shipbuilding Co., Ltd. Optical molding apparatus and movable base device therefor. 5,009,585, Cl. 425-174.400.
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Yasumura, Hiroto; Hirasawa, Masahide; Noji, Minoru; Kozuki, Susumu; Takahashi, Koji; and Yoshimura, Katsuji, 5,010,416, Cl. 358-314.000.
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Hasegawa, Masahide; Otokawa, Mitsuhiro; Matsuoka, Hidetoshi; and Hirata, Noritsugu, 5,010,424, Cl. 360-77.140.
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Hirazawa, Nobuhiro, to Tokai Rubber Industries, Ltd. Fluid-filled elastic mount. 5,009,404, Cl. 267-140.100.
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Hirose, Sachio; Hane, Motomu; and Inagawa, Masanobu, to Mitsubishi Petrochemical Co., Ltd. Novel calcitonin derivative and salt thereof. 5,010,174, Cl. 530-307.000.
Hirose, Syunichi: *See*—
Tokiwa, Yukio; Ichikawa, Fumitoshi; Nakamura, Naomi; Hirose, Syunichi; and Inokuchi, Haruhisa, 5,010,467, Cl. 363-37.000.
Hirose, Toshihiko: *See*—
Hasegawa, Takanori; Abe, Nobuyuki; Hibara, Toru; Hirose, Toshihiko; Kanda, Takashi; Saito, Hiroshi; Oshima, Masaki; and Nakazawa, Eiji, 5,010,420, Cl. 358-471.000.
Hiroshima, Koichi: *See*—
Araya, Junji; Ohzeki, Yukihiro; Miyamoto, Toshio; Hiroshima, Koichi; Sato, Yasushi; and Nakahata, Kimio, 5,010,370, Cl. 355-274.000.
Hirota, Hajime: *See*—
Watanabe, Taichi; Ogino, Hidekazu; Hirota, Hajime; Koshika, Tomohito; Moriya, Naoko; and Nozaki, Toshio, 5,009,813, Cl. 252-545.000.
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Endo, Mineyo; Takegami, Kiyoyoshi; Hishida, Noriaki; and Miyaji, Itsuo, 5,009,436, Cl. 277-80.000.
Hitachi Chemical Company, Ltd.: *See*—
Tanaka, Kazuyuki; Iwami, Etsuji; Matsuzawa, Jun; Mukoyama, Yoshiyuki; Shibata, Noriohiko; Hanawa, Akinori; and Yokota, Mitsuo, 5,009,949, Cl. 428-260.000.
Hitachi Communication System, Inc.: *See*—
Hikita, Mitsutaka; Sumioka, Atsushi; Tabuchi, Toyoji; Kurosawa, Kazuhito; and Kinoshita, Tuneo, 5,010,269, Cl. 310-313.00B.
Hitachi Computer Engineering Co., Ltd.: *See*—
Matsumoto, Kenji; Yanagita, Tomoatsu; Nishiyama, Yoshinori; Nagai, Masahiko; and Morikuni, Mitsuru, 5,010,493, Cl. 364-490.000.
Hitachi Denshi Kabushiki Kaisha: *See*—
Hikita, Mitsutaka; Sumioka, Atsushi; Tabuchi, Toyoji; Kurosawa, Kazuhito; and Kinoshita, Tuneo, 5,010,269, Cl. 310-313.00B.
Hitachi, Ltd.: *See*—
Hayase, Isao; and Tejima, Kunisuke, 5,009,577, Cl. 417-295.000.
Hikita, Mitsutaka; Sumioka, Atsushi; Tabuchi, Toyoji; Kurosawa, Kazuhito; and Kinoshita, Tuneo, 5,010,269, Cl. 310-313.00B.
Iizuka, Nobuyuki; Hirose, Fumiyuki; Asahi, Naotatsu; and Kojima, Yoshitaka, 5,009,070, Cl. 60-753.000.
Kadono, Osamu; and Ushizima, Kunio, 5,010,238, Cl. 235-379.000.
Kitada, Masahiro; Shimizu, Noboru; Tanabe, Hideo; and Nakamura, Hitoshi, 5,010,433, Cl. 360-113.000.
Matsumoto, Kenji; Yanagita, Tomoatsu; Nishiyama, Yoshinori; Nagai, Masahiko; and Morikuni, Mitsuru, 5,010,493, Cl. 364-490.000.
Migita, Masahito; Uda, Tsuyoshi; Kanehisa, Osam; and Shiiki, Masatoshi, 5,010,517, Cl. 365-114.000.
Mishina, Yusuke; and Kojima, Keiji, 5,010,483, Cl. 364-200.000.
Mori, Kinji; Kunai, Yuko; Akiyama, Masakazu; Kadoya, Tadaaki; Kawano, Katsumi; Miyamoto, Shoji; Nohmi, Makoto; Shingai, Sadanori; and Ihara, Hirokazu, 5,010,479, Cl. 364-200.000.
Ogino, Masanori; Yamada, Takeo; and Ikeda, Miyuki, 5,010,280, Cl. 315-388.000.
Omoda, Koichiro; Tanaka, Teruo; Nakagoshi, Junji; Hamanaka, Naoki; and Nagashima, Shigeo, 5,010,477, Cl. 364-200.000.
Shimada, Akira, 5,010,497, Cl. 364-519.000.
Yamamoto, Hikari, 5,010,324, Cl. 340-723.000.
Yoneda, Kenzi; Ueshima, Takaaki; Kuzunuki, Soshiro; Morita, Yuzo; and Tobita, Toshimitsu, 5,010,472, Cl. 364-148.000.
Hitachi Metals, Ltd.: *See*—
Shinohara, Tadashi; Nishiyama, Toshikazu; Noguchi, Kazumi; Iwata, Hitoshi; and Suwabe, Shigekazu, 5,010,431, Cl. 360-103.000.
Taguchi, Akira; Morita, Shigetoshi; Taka, Shunichi; Yamada, Hirohide; Takada, Yoshiaki; Furuichi, Shinji; and Ao, Masahiro, 5,010,429, Cl. 360-103.000.
Hitachi Seiko, Ltd.: *See*—
Arai, Kunio; and Kanaya, Yasuhiko, 5,010,232, Cl. 219-121.700.
Hitaka, Yosato: *See*—
Kawamura, Hideaki; Fujibayashi, Kentaro; and Hitaka, Yosato, 5,010,285, Cl. 318-569.000.
Hitoshi, Nagato: *See*—
Masasumi, Yana; Hitoshi, Nagato; Kiyoshi, Yamada; Shyoji, Ueno; and Kunihiro, Shibuya, 5,009,527, Cl. 400-120.000.
Hitzeman, Ronald A.: *See*—
Chang, Chung N.; Hitzeman, Ronald A.; and Matteucci, Mark D., 5,010,003, Cl. 435-69.900.
Hjaltason, Thorgeir D.: *See*—
Erlendsson, Gudni; and Hjaltason, Thorgeir D., 5,009,019, Cl. 40-541.000.
Ho, Fang C.: *See*—
Dobrowolski, Jerzy A.; Ho, Fang C.; and Waldorf, Allan J., 5,009,486, Cl. 350-164.000.
Hodgkin, Johnathon: *See*—
Steele, John; Johansen, Oddvar; Johnson, Graham; and Hodgkin, Johnathon, 5,010,009, Cl. 435-240.243.
Hodgson, Graham, to British Nuclear Fuels plc. Uranium dioxide production. 5,009,817, Cl. 264-0.500.
Hoechst AG: *See*—
Sprintschnik, Gerhard; Niederstaetter, Walter; Reiss, Kurt; von Asten, Wolfgang; Scharf, Gunther; and Grzembra, Barbara, 5,009,722, Cl. 148-2.000.
Hoechst Aktiengesellschaft: *See*—
Springer, Hartmut; and Reiher, Uwe, 5,010,180, Cl. 534-638.000.
Walch, Axel; Wildhardt, Juergen; and Beissel, Dieter, 5,009,824, Cl. 264-45.100.
Wullbrandt, Dieter; Keller, Reinhold; Schlingmann, Merten; Holla, Wolfgang; and Schneider, Manfred, 5,010,012, Cl. 435-280.000.
Hoechst Celanese Corporation: *See*—
Cohen, Richmond R.; and Luzio, Gary A., 5,009,239, Cl. 131-342.000.
Hoechst-Roussel Pharmaceuticals, Inc.: *See*—
Allen, Richard C.; Agnew, Marc N.; and Fink, David M., 5,010,083, Cl. 514-292.000.
Hofer, Peter, to Euroceltique, S.A. 6-thioxanthines. 5,010,081, Cl. 514-263.000.
Hoffman, Chalres T., Jr.; Gordon, Ralph A.; Hosmer, Thomas P.; and Lucas, Robert M., to General Motors Corporation. Mechanism and method of positive arcuate orientation of a first member and a second member, particularly for brake adjusted orientation of a drive member and a driven member in a disc brake assembly having parking brake mechanism. 5,009,292, Cl. 188-71.700.
Hoffman, Clifford J. Interactive overlay driven computer display system. 5,010,323, Cl. 340-706.000.
Hoffmann, Hans-Jurgen: *See*—
Herberg, Gerhard; Hoffmann, Hans-Jurgen; Gesenhues, Ludger; Huang, Zhen; and Hoscher, Reinhard, 5,009,450, Cl. 280-707.000.
Hoffmann-La Roche Inc.: *See*—
Lambert, Robert W.; Martin, Joseph A.; and Thomas, Gareth J., 5,010,060, Cl. 514-49.000.
Hogue, Etheridge C., to Hogue, Etheridge C. Portable automatic water-releasing plant receptacle. 5,009,032, Cl. 47-79.000.
Hokuyo, Shigeru; Oda, Takao; and Matsumoto, Hideo, to Mitsubishi Denki Kabushiki Kaisha. Solar cell. 5,009,720, Cl. 136-255.000.
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Matsumoto, Hideo; and Hokuyo, Shigeru, 5,009,721, Cl. 136-256.000.
Holder, Tommie J.: *See*—
Sullivan, Robert W.; Holder, Tommie J.; and Buchanan, Max F., 5,009,198, Cl. 123-43.00A.
Holfelder, Gerhard: *See*—
Grunwald, Werner; Holfelder, Gerhard; De La Prieta, Claudio; and Schmid, Kurt, 5,009,708, Cl. 106-105.000.
Holla, Wolfgang: *See*—
Wullbrandt, Dieter; Keller, Reinhold; Schlingmann, Merten; Holla, Wolfgang; and Schneider, Manfred, 5,010,012, Cl. 435-280.000.
Holt, William T. Hull hole closure for an oil tanker. 5,009,180, Cl. 114-229.000.
Holt, William T. Mechanical resuscitator. 5,009,226, Cl. 128-205.180.
Holtan, Ramer B., Jr.; Falk, Kevin L.; Bergman, James F.; Smith, James R.; and Nelson, Kenneth E., to Holtan, Ramer B., Jr. Eyeglasses and headgear combination. 5,009,496, Cl. 351-156.000.
Holtzer, Dominique. Removable coin storage receptacle for slot machines. 5,009,365, Cl. 232-16.000.
Honda Giken Kogyo Kabushiki Kaisha: *See*—
Hatomoto, Isamu; and Matsuo, Yoshiteru, 5,009,946, Cl. 428-87.000.
Kushida, Kazumitsu; Kudou, Osamu; Ogawa, Sumitaka; and Uike, Hiroshi, 5,009,211, Cl. 123-491.000.
Saitoh, Masahiro; Yoshida, Suguru; Obata, Keiichi; and Ono, Yoshinobu, 5,009,463, Cl. 296-210.000.
Seki, Yasunari, 5,009,203, Cl. 123-90.160.
Honda, Mitsuru; Koike, Atsushi; Kimura, Tomohiro; Ogawa, Kyosuke; and Murai, Keiichi, to Canon Kabushiki Kaisha. Surface-treated metal body, process for producing the same, photoconductive member using the same and rigid ball for treating metal body surface. 5,009,974, Cl. 430-69.000.
Honda, Yutaka: *See*—
Kirihara, Tomoo; Nakagawa, Ippei; Seki, Yoshinobu; Honda, Yutaka; and Ichihara, Yasuo, 5,009,751, Cl. 204-61.000.
Honeywell Inc.: *See*—
Burgener, Larry L.; and Durbin, Larry L., 5,009,385, Cl. 248-346.000.
Dunaway, Thomas J.; Spielberger, Richard K.; Dicks, Lori A.; and Loy, Jerald M., 5,010,387, Cl. 357-70.000.
Lee, James C., 5,009,920, Cl. 427-9.000.
Honkura, Yoshinobu; Matsuo, Toru; and Murata, Kouji, to Aichi Steel Works, Ltd. Method for manufacturing high strength non-magnetic stainless steel. 5,009,723, Cl. 148-12.00E.
Hood, Richard L.: *See*—
Nelson, Stephen R.; and Hood, Richard L., 5,009,772, Cl. 208-309.000.
Hoogovens Groep B.V.: *See*—
den Hartog, Huibert; and van Perlstein, Erik B., 5,009,396, Cl. 266-115.000.
Hooper, Alan: *See*—
Kronfli, Esam; Lovell, Keith V.; Hooper, Alan; and Neat, Robin J., 5,009,970, Cl. 429-192.000.
Hoover, Lonnie D.: *See*—
House, Roy F.; and Hoover, Lonnie D., 5,009,798, Cl. 252-8.551.
Hopper, Steven R. Portable light assembly for an automobile. 5,010,454, Cl. 362-61.000.
Horii, Masami; Komakine, Shigeo; Ochiai, Kuniaki; and Kondoh, Takashi, to Tokyo Electric Co., Ltd. Dot print head. 5,009,528, Cl. 400-124.000.
Horikiri, Kazuhito: *See*—
Hirano, Yoshinao; Sato, Katsumo; Nagamori, Shigeru; Murata, Katsuhide; Horikiri, Kazuhito; and Shirai, Junji, 5,009,585, Cl. 425-174.400.
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Yoshio, Junichi; Hosaka, Sumio; Matsuoka, Hisao; Tsuda, Youichirou; Katagiri, Shoichi; and Nomura, Satoru, 5,010,417, Cl. 358-335.000.
Hoscher, Reinhard: *See*—
Herberg, Gerhard; Hoffmann, Hans-Jurgen; Gesenhues, Ludger; Huang, Zhen; and Hoscher, Reinhard, 5,009,450, Cl. 280-707.000.
Hoshino, Akira: *See*—
Harada, Kyouji; Kato, Eiji; Sakaguchi, Yoshikazu; Watanabe, Suzuaki; and Hoshino, Akira, 5,009,290, Cl. 188-71.500.
Hosmer, Thomas P.: *See*—
Hoffman, Chalres T., Jr.; Gordon, Ralph A.; Hosmer, Thomas P.; and Lucas, Robert M., 5,009,292, Cl. 188-71.700.
Hosotani, Shiro: *See*—
Miki, Takahiro; and Hosotani, Shiro, 5,010,338, Cl. 341-159.000.
Hosotani, Takashi; and Inoue, Kiyoshi, to Nissan Motor Co., Ltd. Control for load carrier of lift truck. 5,009,562, Cl. 414-440.000.

Hosoya, Hideki: *See—*
Enari, Masahiko; Shikichi, Satoshi; Kawaguchi, Fumiaki; Suzuki, Kenichi; Usui, Masayuki; Matsuoka, Hiroshi; Matsuoka, Kazuhiko; Hosoya, Hideki; Aoki, Akio; and Minoura, Kazuo, 5,010,534, Cl. 369-32.000.

Hosoya, Yoshihiro: *See—*
Nishimoto, Akihiko; Hosoya, Yoshihiro; Tomita, Kunikazu; Urabe, Toshiaki; and Jitsukawa, Masaharu, 5,009,726, Cl. 148-111.000.

Hossain, Shafi U.; and Blaney, Carol A., to Kimberly-Clark Corporation. Method for removing polychlorinated dibenzodioxins and polychlorinated dibenzofurans from secondary fibers using supercritical CO_2 extraction. 5,009,745, Cl. 162-5.000.

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Hostetler, Eldon, to Ziggity Systems, Inc. Drinker shield. 5,009,194, Cl. 119-72.000.

Hotta, Shu: *See—*
Wakita, Katsuya; Sonoda, Nobuo; Shimizu, Tokihiko; Hotta, Shu; and Soga, Mamoru, 5,009,815, Cl. 252-582.000.

Hotta, Tetsuo: *See—*
Iwata, Takao; and Hotta, Tetsuo, 5,009,460, Cl. 296-93.000.

Houk, T. L.: *See—*
Falk, R. A.; Capps, C. D.; and Houk, T. L., 5,010,505, Cl. 364-713.000.

Houlihan, William J.: *See—*
Handley, Dean A.; Houlihan, William J.; and Weinstein, David B., 5,010,067, Cl. 514-75.000.

House, Roy F.; and Hoover, Lonnie D., to Baroid Technology, Inc. Low fluid loss heavy brines containing hydroxyethyl cellulose. 5,009,798, Cl. 252-8.551.

Housman, Joseph J.: *See—*
Missimer, Dale J.; Fyfe, David T., Jr.; Housman, Joseph J.; and Forrest, Scott M., 5,009,073, Cl. 62-51.100.

Hovsepian, Mirik: *See—*
West, Paul; Hovsepian, Mirik; and Thomas, Ronald, 5,009,111, Cl. 73-862.610.

Howard, John H.: *See—*
Raikes, Terry E.; Kramer, William L.; Howard, John H.; Moore, Wayne D.; Jackson, Louis; and Kotecki, Jeffrey D., 5,009,276, Cl. 177-25.150.

Howatt, George F. Ball-tip stud and alignment tool and method of use. 5,009,443, Cl. 280-477.000.

Howe, Michael G.; Arthur, James C.; and Usleman, Robert T., to Arvin Industries, Inc. Tuned exhaust processor assembly. 5,009,065, Cl. 60-288.000.

Howell, Peter P.: *See—*
Johnson, Harlan B.; Wiedrich, Charles R.; Allen, Ernie L.; and Howell, Peter P., 5,009,806, Cl. 252-187.280.

Hoyt, Donald A., to Attacher Lures. High speed fishing lure. 5,009,023, Cl. 43-42.500.

Hrncirik, Dennis J., to Rockwell International Corporation. Spurious level reduction and control method for direct digital synthesizers. 5,010,506, Cl. 364-721.000.

Hsiao, Charles, to Baker Cummins Pharmaceuticals, Inc. Arrangement for and method of administering a pharmaceutical preparation. 5,009,894, Cl. 424-451.000.

Hu, Chun-Min: *See—*
Chiang, Wen-Yen; and Hu, Chun-Min, 5,010,134, Cl. 525-57.000.

Huang, Xiaohua: *See—*
Zare, Richard N.; Huang, Xiaohua; and Ohms, Jack I., 5,009,760, Cl. 204-183.300.

Huang, Zhen: *See—*
Herberg, Gerhard; Hoffmann, Hans-Jurgen; Gesenhues, Ludger; Huang, Zhen; and Hoscher, Reinhard, 5,009,450, Cl. 280-707.000.

Hubbard, Vance M.; and Brunson, Welton K., to Tecnol, Inc. Sanitary head covering and method of manufacture. 5,008,961, Cl. 2-195.000.

Huberty, John P.: *See—*
Engelstad, Barry L.; Raymond, Kenneth N.; Huberty, John P.; and White, David L., 5,010,191, Cl. 544-225.000.

Huebner, Werner: *See—*
Steck, Werner; Marosi, Laszlo; Haberkorn, Herbert; Feser, Rainer; Huebner, Werner; and Jakusch, Helmut, 5,009,877, Cl. 423-607.000.

Huels Aktiengesellschaft: *See—*
Scharf, Helmut, 5,009,878, Cl. 423-608.000.

Hueniken, Peter; Gurd, John A.; and Woodman, Douglas, to Siemens Automotive Limited. Inertia switch mounting housing. 5,010,217, Cl. 200-61.45R.

Huffaker, Almyria; and Spector, George. Instruction clip for sewing machine. 5,009,382, Cl. 248-284.000.

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Bathrick, Erwin W.; and Zmuda, James E., 5,010,572, Cl. 380-21.000.
Crumly, William R.; Woith, Blake F.; and Walen, James R., 5,009,605, Cl. 439-67.000.
Grinberg, Jan; Welkowsky, Murray S.; Wu, Chiung-Sheng; and Braatz, Paul O., 5,010,251, Cl. 250-332.000.
Hall, James T., 5,009,485, Cl. 350-163.000.
Iossi, Daryl R.; Cook, Lacy G.; and Koppensteiner, Alfred, 5,009,494, Cl. 350-620.000.
Kelly, Kenneth C., 5,010,351, Cl. 343-771.000.
Shih, I-Fu; Chang, David B.; Arns, James A.; Moss, Gaylord E.; and Smith, Ronald T., 5,009,502, Cl. 356-152.000.

Hughes, Dale L.: *See—*
Sawyer, Alan G.; Hughes, Dale L.; and Petree, Edwyn H., 5,009,006, Cl. 30-90.600.

Hughes, Ian: *See—*
Markwell, Roger E.; Smith, Stephen A.; Hughes, Ian; and Gaster, Laramie M., 5,010,097, Cl. 514-419.000.

Huizinga, Gert J., to LPF Verpakkingen B.V. Method of forming lines of weakness in or grooving a plastic material, especially a packaging material. 5,010,231, Cl. 219-121.690.

Hula, Emil; and Maresch, Gerald, to Maschinenfabrik Andritz Actiengesellschaft. Process and apparatus for the manufacture of a metal foil. 5,009,750, Cl. 204-13.000.

Huls Aktiengesellschaft: *See—*
Kelkenberg, Heike; Ruback, Wulf; and Engel, Klaus, 5,009,814, Cl. 252-548.000.

Hummel, Axel: *See—*
Traubel, Harro; Strenger, Heinrich; Weber, Karl A.; Muller, Hans-Werner; Zapfel, Horst; and Hummel, Axel, 5,009,921, Cl. 427-31.000.

Hungerford, Robert E. Barbecuing protective food support. 5,009,151, Cl. 99-445.000.

Hunter Douglas Inc.: *See—*
Fraser, Donald E., 5,009,258, Cl. 160-168.100.

Hunter, Gregory H.; Wells, Benjamin A.; and Feldstein, Michael A., to Reflection Technology, Inc. Low vibration resonant scanning unit for miniature optical display apparatus. 5,009,473, Cl. 350-6.600.

Huntley, William P.; and Swanick, David J., to United States of America, Navy. High pulse repetition frequency radar early warning receiver. 5,010,341, Cl. 342-20.000.

Hurley, Walter L.: *See—*
Schuler, Linda A.; Gorski, Jack; Hurley, Walter L.; Bremel, Robert D.; and Rottman, Fritz M., 5,010,011, Cl. 435-252.300.

Hutchings, Michael G.: *See—*
McDonald, Edward; Salmon, Roger; Whittle, Alan J.; and Hutchings, Michael G., 5,010,200, Cl. 546-245.000.

Hutchinson, Donald P., to EOL, Inc. Personal glucose monitor. 5,009,230, Cl. 128-633.000.

Huth, Andreas: *See—*
Braestrup, Claus T.; Nielsen, Mogens C.; Christensen, Joergen A.; Engelstoft, Mogens; Schou, Henning; Eder, Ulrich; Neef, Gunter; Huth, Andreas; Rahtz, Dieter; and Schmiechen, Ralph, 5,010,077, Cl. 514-228.800.

Hvozda, Carl K.: *See—*
Karg, Kenneth A.; Hvozda, Carl K.; Neddermeyer, Robert N.; and Feld, Alexander, 5,009,148, Cl. 98-10.000.

Hyland, George J., to Crane Co. Motor driven pumps. 5,009,578, Cl. 417-365.000.

Hyvarinen, Olli V. J.: *See—*
Heimala, Seppo O.; Hyvarinen, Olli V. J.; and Metsarinta, Maija-Leena, 5,009,870, Cl. 423-239.000.

I-Stat Corporation: *See—*
Lauks, Imants R., 5,009,766, Cl. 204-419.000.

Ibach, Harald: *See—*
Boden, Karl; Ibach, Harald; and Linke, Udo, 5,009,865, Cl. 422-249.000.

Ibe, Hiroyuki; and Uesugi, Toshiharu, to Shin-Etsu Handotai Company Limited. Recharging device for czochralski method. 5,009,864, Cl. 422-249.000.

Ibsen, Robert L.; Chadwick, Thomas C.; and Pritchard, Sally A., to Den-Mat Corporation. Strong dental porcelain and method for its manufacture. 5,009,709, Cl. 106-35.000.

Ichihara, Yasuo: *See—*
Kirihara, Tomoo; Nakagawa, Ippei; Seki, Yoshinobu; Honda, Yutaka; and Ichihara, Yasuo, 5,009,751, Cl. 204-61.000.

Ichikawa, Fumitoshi: *See—*
Tokiwa, Yukio; Ichikawa, Fumitoshi; Nakamura, Naomi; Hirose, Syunichi; and Inokuchi, Haruhisa, 5,010,467, Cl. 363-37.000.

Ichikawa, Mitsuo: *See—*
Matsumoto, Sakae; and Ichikawa, Mitsuo, 5,009,121, Cl. 74-493.000.

Idel, Karsten: *See—*
Serini, Volker; Freitag, Dieter; Westeppe, Uwe; Idel, Karsten; Grigo, Ulrich; Casser, Carl; Paetz, Klaus-Christian; and Hajek, Manfred, 5,010,162, Cl. 528-196.000.
Serini, Volker; Freitag, Dieter; Westeppe, Uwe; Idel, Karsten; Grigo, Ulrich; Casser, Carl; Paetz, Klaus-Christian; and Hajek, Manfred, 5,010,163, Cl. 528-196.000.

Idel, Karsten-Josef: *See—*
Westeppe, Uwe; Weymans, Gunther; Grigo, Ulrich; Idel, Karsten-Josef; and Freitag, Dieter, 5,010,147, Cl. 525-462.000.

Idemitsu Petrochemical Co., Ltd.: *See—*
Tomotsu, Norio, 5,010,151, Cl. 526-105.000.

Iggulden, Jerry R.: *See—*
Streck, Donald A.; and Iggulden, Jerry R., 5,009,368, Cl. 239-70.000.

Ihara, Hirokazu: *See—*
Mori, Kinji; Kunai, Yuko; Akiyama, Masakazu; Kadoya, Tadaaki; Kawano, Katsumi; Miyamoto, Shoji; Nohmi, Makoto; Shingai, Sadanori; and Ihara, Hirokazu, 5,010,479, Cl. 364-200.000.

Iida, Hideyo: *See—*
Hayashi, Yutaka; Itoh, Atuo; Imai, Mizuho; and Iida, Hideyo, 5,009,928, Cl. 427-126.300.

Iida, Shinobu; Fujiyama, Masaaki; and Yamada, Keisuke, to Fuji Photo Film Co., Ltd. Process for the preparation of magnetic recording medium. 5,009,929, Cl. 427-130.000.

Iizuka, Nobuyuki; Hirose, Fumiyuki; Asahi, Naotatsu; and Kojima, Yoshitaka, to Hitachi, Ltd. Combustion apparatus for gas turbine. 5,009,070, Cl. 60-753.000.
Ikada, Yoshito; and Gen, Shokyu, to Daicel Chemical Industries, Ltd. Polylactic acid fiber. 5,010,145, Cl. 525-415.000.
Ikata, Yoshikatsu: *See*—
Utsugi, Nobuo; Kihara, Hisashi; Mori, Shuichi; Fuse, Junichi; Miyake, Takashi; and Ikata, Yoshikatsu, 5,010,437, Cl. 360-137.000.
Ikebe, Masaru: *See*—
Shiba, Haruo; Ikebe, Masaru; and Ishida, Toshihiko, 5,010,435, Cl. 360-133.000.
Ikeda Bussan Co., Ltd.: *See*—
Mouri, Takayuki, 5,009,469, Cl. 297-468.000.
Ikeda, Hayato; Sawada, Masahiro; Nakamura, Norihiko; and Yokomachi, Naoya, to Kabushiki Kaisha Toyoda Jidoshokki Seisakushi. Lubricating oil supplying mechanism in swash plate type compressor. 5,009,286, Cl. 184-6.170.
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Ikeda, Hisami: *See*—
Albino, Anthony; Lloyd, Kenneth; Ikeda, Hisami; and Old, Lloyd, 5,009,995, Cl. 435-7.230.
Ikeda, Kazunari; and Sanada, Koichi, to Bridgestone Corporation. Method of manufacturing member for use in tire including engaging wires between gears. 5,009,732, Cl. 156-177.000.
Ikeda, Keiichi: *See*—
Hasegawa, Minekazu; Ikeda, Keiichi; and Fujihira, Junichi, 5,009,464, Cl. 296-213.000.
Ikeda, Kyoichi: *See*—
Harada, Kinji; Ikeda, Kyoichi; Kuwayama, Hideki; Kobayashi, Takashi; Nishikawa, Tadashi; Watanabe, Tetsuya; and Yoshida, Takashi, 5,009,108, Cl. 73-704.000.
Ikeda, Masaaki: *See*—
Kanehira, Makoto; Nakagawa, Takerou; Tsubakimoto, Yasumasa; Tanaka, Kouji; Takahashi, Toshio; and Ikeda, Masaaki, 5,009,630, Cl. 474-211.000.
Ikeda, Miyuki: *See*—
Ogino, Masanori; Yamada, Takeo; and Ikeda, Miyuki, 5,010,280, Cl. 315-388.000.
Ikeda, Takeo. Sushi forming method. 5,009,905, Cl. 426-297.000.
Ikeda, Yasuhiro, to Shin-Etsu Handotai Co., Ltd. Semiconductor rod zone melting apparatus. 5,009,860, Cl. 422-250.000.
Ilford Limited: *See*—
Mowforth, Clive W.; Bullock, James F.; Maternaghan, Trevor J.; and Harvey, Karen N., 5,009,991, Cl. 430-567.000.
Ilmanen, Reijo: *See*—
LePisto, Matti; Ilmanen, Reijo; Karlsson, Markku; and Laakso, Sauli, 5,009,016, Cl. 34-41.000.
Imae, Toshihiro: *See*—
Akazawa, Hiroyuki; and Imae, Toshihiro, 5,009,532, Cl. 400-636.200.
Imai, Mizuho: *See*—
Hayashi, Yutaka; Itoh, Atuo; Imai, Mizuho; and Iida, Hideyo, 5,009,928, Cl. 427-126.300.
Minagawa, Hidenobu; Tatsumi, Yuuichi; Iwahashi, Hiroshi; Asano, Masamichi; Nakai, Hiroto; and Imai, Mizuho, 5,010,520, Cl. 365-174.000.
Imamoto, Hiroshi: *See*—
Imanaka, Koichi; and Imamoto, Hiroshi, 5,010,556, Cl. 372-46.000.
Imanage, Eisuke: *See*—
Ohkawa, Osamu; Tamahoko, Tetsuya; and Imanage, Eisuke, 5,009,296, Cl. 192-20.000.
Imanaka, Koichi; and Imamoto, Hiroshi, to Omron Tateisi Electronics Co. A stripe-shaped heterojunction laser with unique current confinement. 5,010,556, Cl. 372-46.000.
Imhoff, Ray; and Seif, Sadraddin. Water conservation device. 5,009,572, Cl. 417-32.000.
Imperial Chemical Industries PLC: *See*—
McDonald, Edward; Salmon, Roger; Whittle, Alan J.; and Hutchings, Michael G., 5,010,200, Cl. 546-245.000.
Ramshaw, Colin; and Winnington, Terence, 5,009,085, Cl. 62-476.000.
Yeates, Steven G.; and Padget, John C., 5,010,121, Cl. 523-336.000.
Yelland, Michael; and Conway, John, 5,010,192, Cl. 544-239.000.
Imtech International, Inc.: *See*—
Bahr, Edward, 5,010,413, Cl. 358-242.000.
In Vitro Scientific Products, Inc.: *See*—
Serkes, Jonathan M.; and Foschaar, William L., 5,010,013, Cl. 435-285.000.
INA Walzlager Schaeffler KG: *See*—
Seegers, Hanns, 5,009,299, Cl. 192-85.00C.
Inagaki, Notoshi: *See*—
Yoshida, Keiji; Funato, Ryo; Takahiro, Syuji; Kubo, Shinji; and Inagaki, Notoshi, 5,009,978, Cl. 430-109.000.
Inagaki, Syoji: *See*—
Kamayachi, Yuichi; and Inagaki, Syoji, 5,009,982, Cl. 430-280.000.
Inagawa, Masanobu: *See*—
Hirose, Sachio; Hane, Motomu; and Inagawa, Masanobu, 5,010,174, Cl. 530-307.000.
Incorvia, Samuel A.: *See*—
Cullen, John S.; Incorvia, Samuel A.; Nigon, Christopher S.; and Vaylen, Nicholas E., 5,009,308, Cl. 206-204.000.
Induni, Michael L. Roll-up roof covering for automobiles with removable roof panels. 5,009,465, Cl. 296-219.000.
Industrial Material Technology, Inc.: *See*—
Castellano, Thomas P., 5,009,291, Cl. 188-71.600.
Industrie Automation Sondertechnik GmbH & Co.: *See*—
Muller, German, 5,009,793, Cl. 210-710.000.
Ingersoll-Rand Company: *See*—
Gagnet, Thomas R., 5,009,576, Cl. 417-295.000.
Inline Connection Corporation: *See*—
Goodman, David D.; and Domnitz, Robert, 5,010,399, Cl. 358-85.000.
Inoi, Takeshi, to Chisso Corporation. Antimicrobial agent composition. 5,010,109, Cl. 514-714.000.
Inokuchi, Haruhisa: *See*—
Tokiwa, Yukio; Ichikawa, Fumitoshi; Nakamura, Naomi; Hirose, Syunichi; and Inokuchi, Haruhisa, 5,010,467, Cl. 363-37.000.
Inorganic Recycling Incorporated: *See*—
Sarko, Leonard S.; and Lyon, Richard S., 5,009,511, Cl. 366-348.000.
Inoue, Hideaki: *See*—
Noda, Hidetoshi; Gocho, Makoto; Shimizu, Masayasu; Komatsu, Osamu; and Inoue, Hideaki, 5,009,707, Cl. 75-375.000.
Inoue, Hiroshi; Yokono, Wataru; and Okuda, Yasuji, to Sakura Color Products Corp. Water base pigment ink compositions for use in marking pens. 5,009,536, Cl. 401-198.000.
Inoue, Kiyoshi: *See*—
Hosotani, Takashi; and Inoue, Kiyoshi, 5,009,562, Cl. 414-440.000.
Inoue, Noriyuki; and Heki, Tatsuo, to Fuji Photo Film Co., Ltd. Direct positive photographic material. 5,009,993, Cl. 430-605.000.
Inoue, Takashi: *See*—
Sato, Izumi; Saito, Koji; and Inoue, Takashi, 5,009,103, Cl. 73-597.000.
Inoue, Tetsuo: *See*—
Yamada, Takehito; Tanimoto, Kazushi; Sakai, Yuji; Muraoka, Takao; Inoue, Tetsuo; and Takada, Yoshinao, 5,010,430, Cl. 360-103.000.
Inoue, Yoshinori; Kumanoya, Masaki; Komatsu, Takahiro; Konishi, Yasuhiro; and Dosaka, Katsumi, to Mitsubishi Denki Kabushiki Kaisha. Voltage boosting circuit and operating method thereof. 5,010,259, Cl. 307-482.000.
Insalaco, Michael D.: *See*—
Kubler, John M.; and Insalaco, Michael D., 5,009,106, Cl. 73-651.000.
Institut de Recherches de la Siderurgie Francaise-Irsid: *See*—
Siener, Pjerre; and Steiner, Antoine, 5,010,578, Cl. 382-8.000.
Institut Elektrosvarki Imeni E.O. Patona Akademii Nauk Ukrainskoi SSR: *See*—
Paton, Boris E.; Utkin, Vladimir F.; Nedoseka, Anatoly Y.; Khromyak, Nikolai T.; Gorlitsyn, Nikolai V.; Tikhy, Viktor G.; Mezintsev, Evgeny D.; and Mezhuev, Nikolai N., 5,010,503, Cl. 364-569.000.
Institut Francais Du Petrole: *See*—
Petit, Laurent; Bournonville, Jean-Paul; Guth, Jean-Louis; Raatz, Francis; and Seive, Alain, 5,010,048, Cl. 502-61.000.
Institute Francais du Petrole: *See*—
Lessi, Jacques; Perreau, Philippe; Bary, Daniel; and Grard, Guy, 5,009,512, Cl. 374-6.000.
Instituto Chimico Internazionale Dr. Giuseppe Rende S.r.l.: *See*—
Antonaroli, Simonetta; Bianco, Armandodariano; Brufani, Mario; Lo Baido, Giuseppe; and Rende, Giorgio, 5,010,204, Cl. 548-128.000.
Intech International, Inc.: *See*—
Walter, Bruno H., 5,009,272, Cl. 175-56.000.
Intel Corporation: *See*—
Sit, Hon P.; Galbi, David; and Chan, Alfred K., 5,010,508, Cl. 364-748.000.
Inter-Link Communciations Inc.: *See*—
Gerke, David B.; and MacDonald, Michael, 5,009,384, Cl. 248-343.000.
Interconnect Devices, Inc.: *See*—
Langgard, Ulf R.; and Thurston, William E., 5,009,613, Cl. 439-482.000.
Interlock Corporation: *See*—
Mobley, Dewey F.; Peterson, Robert G., Sr.; and LaCava, James E., 5,009,615, Cl. 439-595.000.
Internacional de Technicas y diseno, S.A.: *See*—
Perez Blanco, Juan M., 5,009,415, Cl. 272-114.000.
International Business Machines Corp.: *See*—
Biasillo, Alberto; and Taylor, Richard C., 5,010,491, Cl. 364-474.280.
Boudon, Gerard; Mollier, Pierre; Nuez, Jean-Paul; Ong, Ieng; Tannhof, Pascal; and Wallart, Franck, 5,010,257, Cl. 307-446.000.
Davis, Gordon T., 5,010,476, Cl. 364-200.000.
Fifield, John A.; and Kalter, Howard L., 5,010,524, Cl. 365-205.000.
Gansauge, Peter; Kreuter, Volker; and Schettler, Helmut, 5,010,389, Cl. 357-67.000.
Granger, Yves; and Wind, Daniel, 5,010,548, Cl. 370-95.100.
Hartstein, Allan M.; and Koch, Roger H., 5,010,512, Cl. 364-807.000.
Kippenhan, B. William; and Maholick, Andrew W., 5,010,514, Cl. 364-900.000.
Nagy, Michael E., 5,010,344, Cl. 341-65.000.
Nagy, Michael E., 5,010,345, Cl. 341-65.000.
International Dioxcide, Inc.: *See*—
Kelley, Joseph M.; Kucher, Donald C.; and Mayurnik, George, 5,009,875, Cl. 423-477.000.

International Fuel Cells: *See—*
Lipman, Kenneth; and Young, Douglas G., 5,010,470, Cl. 363-132.000.
International Fuel Cells Corporation: *See—*
Guthrie, Robin J.; Katz, Murray; and Schroll, Craig R., 5,009,968, Cl. 429-26.000.
Scheffler, Glenn W., 5,009,967, Cl. 429-23.000.
International Immunoassay Laboratories, Inc.: *See—*
Shah, Vipin D.; Kulkarni, Padmaker V.; and Miranda, Quirinus R., 5,009,996, Cl. 435-7.000.
International Superconductor Corp.: *See—*
Hed, Aharon Z., 5,010,311, Cl. 335-216.000.
Interuniversitair Micro-Elektronica Centrum VZW: *See—*
Dierikx, Bart M. H. L., 5,010,245, Cl. 250-208.100.
Intevep, S.A.: *See—*
Galiasso, Roberto; Morales, Alfredo; and Salazar, Jose A., 5,009,768, Cl. 208-89.000.
Intospace GmbH: *See—*
Plaas-Link, Andreas, 5,009,861, Cl. 422-245.000.
Iossi, Daryl R.; Cook, Lacy G.; and Koppensteiner, Alfred, to Hughes Aircraft Company. Wide field all-reflective multiple field of view telescope. 5,009,494, Cl. 350-620.000.
Irvine, Bruce G. R.: *See—*
Irvine, Bruce W.; and Irvine, Bruce G. R., 5,009,455, Cl. 285-106.000.
Irvine, Bruce W.; and Irvine, Bruce G. R. seal. 5,009,455, Cl. 285-106.000.
Iseler, Stanley J.; Beauch, Howard D.; Everett, Benjamin H., II; and Sutorik, John P., to General Motors Corporation. Manual control for adjustable steering column. 5,009,120, Cl. 74-493.000.
Ishida, Hisaki: *See—*
Nishimura, Eiichi; Nakamura, Takao; and Ishida, Hisaki, 5,010,510, Cl. 364-758.000.
Ishida, Junji: *See—*
Matsuoka, Noriyuki; and Ishida, Junji, 5,009,609, Cl. 439-73.000.
Ishida, Takashi; and Kondo, Masao, to Yamaha Corporation. Automatic performance apparatus having automatic synchronizing function. 5,009,145, Cl. 84-612.000.
Ishida, Tokuji; Norita, Toshio; and Hasegawa, Jun, to Minolta Camera Kabushiki Kaisha. Image sensing system. 5,010,409, Cl. 358-213.190.
Ishida, Tomoyuki, to NEC Corporation. Main memory control system for virtual machine. 5,010,481, Cl. 364-200.000.
Ishida, Toshihiko: *See—*
Shiba, Haruo; Ikebe, Masaru; and Ishida, Toshihiko, 5,010,435, Cl. 360-133.000.
Ishiguro, Takashi: *See—*
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Ishihara, Hiroshi: *See—*
Kuki, Nobuyuki; Isomura, Yukio; Suzumura, Hirokazu; Sakakibara, Yoshikazu; and Ishihara, Hiroshi, 5,009,035, Cl. 49-352.000.
Ishii, Akio: *See—*
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Oshima, Etsuo; Obase, Hiroyuki; Karasawa, Akira; Kubo, Kazuhiro; Miki, Ichiro; and Ishii, Akio, 5,010,104, Cl. 514-510.000.
Ishii, Aya: *See—*
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Ishii, Kazuo: *See—*
Kato, Eiichi; and Ishii, Kazuo, 5,009,975, Cl. 430-96.000.
Ishii, Norio, to Fuji Jukogyo Kabushiki Kaisha. Spark plug arrangement in an overhead camshaft engine. 5,009,204, Cl. 123-193.00H.
Ishii, Takaaki: *See—*
Sakanishi, Masayuki; and Ishii, Takaaki, 5,010,577, Cl. 381-104.000.
Ishii, Tatsuya, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor memory device with two storage nodes. 5,010,379, Cl. 357-23.600.
Ishikawa Gasket Co., Ltd.: *See—*
Udagawa, Tsunekazu, 5,009,438, Cl. 277-235.00B.
Ishikawa Tekko Kabushiki Kaisha: *See—*
Shirai, Tadayoshi; and Hioki, Masahito, 5,009,538, Cl. 403-134.000.
Ishikawa, Yujiro: *See—*
Kuzuya, Susumu; Shimizu, Seiji; Kato, Mikio; Ishikawa, Yujiro; Sakai, Takashi; and Yuki, Eiji, 5,009,530, Cl. 400-188.000.
Ishizaka, Yoshirou: *See—*
Naganuma, Hiroshi; Sato, Kenji; Yamamoto, Masashi; Kubota, Toshiaki; Hayashi, Hiroshige; and Ishizaka, Yoshirou, 5,009,080, Cl. 62-256.000.
Isoda, Satoru: *See—*
Ueyama, Satoshi; Kawakubo, Hiroaki; Isoda, Satoru; and Maeda, Mitsuo, 5,010,451, Cl. 361-504.000.
Isomura, Yukio: *See—*
Kuki, Nobuyuki; Isomura, Yukio; Suzumura, Hirokazu; Sakakibara, Yoshikazu; and Ishihara, Hiroshi, 5,009,035, Cl. 49-352.000.
Isover Saint-Gobain: *See—*
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Isuzu Ceramics Research Institute, Co., Ltd.: *See—*
Kawamura, Hideo, 5,009,389, Cl. 251-129.100.
Isuzu Motors Limited: *See—*
Kawamura, Hideo, 5,009,202, Cl. 123-90.110.
Ito, Atsushi: *See—*
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Itoh, Akira; and Haino, Kozo, to Mitsubishi Paper Mills Limited. Electrophotographic photoreceptor. 5,009,976, Cl. 430-59.000.
Itoh, Atsushi: *See—*
Murakami, Tokumichi; Asai, Kohtaro; Kamizawa, Koh; Nishida, Masami; Yamazaki, Eizo; Itoh, Atsushi; and Kinjoh, Naoto, 5,010,401, Cl. 358-136.000.
Itoh, Atuo: *See—*
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Itoh, Tatsuo, to Advanced Micro Devices, Inc. Circuit for multiplying the frequency in one series of input pulses. 5,010,561, Cl. 377-47.000.
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Ivankovits, John C.: *See—*
Ellison, Thomas L.; Roberts, David A.; Ivankovits, John C.; and Norman, John A. T., 5,009,725, Cl. 148-23.000.
Ivey, John S.; Bateman, Paul M.; Clauss, Julius A.; Cole, Edward H., Jr.; and Mott, Philip J., to Borg-Warner Automotive, Inc. CVT chain-belt. 5,009,631, Cl. 474-213.000.
Ivoditov, Albert N.: *See—*
Lipukhin, Jury V.; Danilov, Leonid I.; Ivoditov, Albert N.; Garber, Eduard A.; Subbotin, Anatoly N.; Pavlov, Valentin P.; Zhukov, Jury K.; and Pimenov, Alexandr F., 5,009,037, Cl. 51-7.000.
Iwahashi, Hiroshi: *See—*
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Iwahashi, Takashi, to Aikoh Co., Ltd. Deodorant composition in the form of a gel. 5,009,887, Cl. 424-76.100.
Iwaki, Takashi: *See—*
Fuji, Hiroshi; Fujiwara, Tsuneo; Iwaki, Takashi; Numata, Tomiyuki; Tsuji, Kentaroh; Maeda, Shigemi; Yamaguchi, Takeshi; Kojima, Kunio; Deguchi, Toshihisa; and Terashima, Shigeo, 5,010,540, Cl. 369-50.000.
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Iwamoto, Kohei: *See—*
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Iwaszkowiec, Carlos, to Monsanto Company. Spray shield unit. 5,009,369, Cl. 239-223.000.
Iwata, Hitoshi: *See—*
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Iwata, Kaoru: *See—*
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Iwata, Takao; and Hotta, Tetsuo, to Hashimoto Forming Industry Co., Ltd. Window molding member for automobiles. 5,009,460, Cl. 296-93.000.
J. C. Pardo and Sons: *See—*
Gabriele, Valentino, 5,009,510, Cl. 366-311.000.
J. I. Case Company: *See—*
McSweeney, Michael A.; and Stufflebeam, John F., 5,009,345, Cl. 222-556.000.
J. M. Huber Corporation: *See—*
Kosin, John A.; Mooney, Gerry; Tarquini, Michael A.; and Garcia, Rod A., 5,009,809, Cl. 252-350.000.
Wason, Satish K.; Mooney, Gerry; Andrews, Claude R.; Tarquini, Michael E.; Kosin, John A.; and Garcia, Rod A., 5,009,810, Cl. 252-350.000.
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Jacob, Jean-Baptiste, to Alcatel Cit. Asynchronous time-division multiservice digital satellite center for connecting subscribers. 5,010,545, Cl. 370-56.000.
Jacobs, James R., to Duke University. Method and apparatus for model-based control of an open-loop process. 5,010,473, Cl. 364-150.000.
Jaeckel, Manfred: *See—*
Worschech, Kurt; Wedl, Peter; Fleischer, Erwin; Loeffelholz, Frido; and Jaeckel, Manfred, 5,010,123, Cl. 524-114.000.
Jaguar Cars Limited: *See—*
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Jahanger, Mohammed S.: *See—*
Cotey, John; and Jahanger, Mohammed S., 5,009,657, Cl. 606-120.000.
Jakusch, Helmut: *See—*
Steck, Werner; Marosi, Laszlo; Haberkorn, Herbert; Feser, Rainer; Huebner, Werner; and Jakusch, Helmut, 5,009,877, Cl. 423-607.000.
Jamp, Rueiming: *See—*
Vincent, Kent D.; and Jamp, Rueiming, 5,010,580, Cl. 382-17.000.
Janesko Oy: *See—*
Kamrat, Esko, 5,009,113, Cl. 73-866.500.
Janney, Mark A.; Newey, Roger; and Robinson, Irwin J., III, to Marconi Instruments, Inc. Data logging apparatus. 5,010,560, Cl. 377-20.000.
Janssen Pharmaceutica N.V.: *See—*
Stokbroekx, Raymond A.; Luyckx, Marcel G. M.; and Janssens, Frans E., 5,010,198, Cl. 546-114.000.

Janssens, Frans E.: *See*—
Stokbroekx, Raymond A.; Luyckx, Marcel G. M.; and Janssens, Frans E., 5,010,198, Cl. 546-114.000.

Jantzen, Ellen E. Shape giving system for soft purses. 5,009,319, Cl. 206-544.000.

Japan as represented by general director of Agency of Industrial Science and Technology: *See*—
Hayashi, Yutaka; Itoh, Atuo; Imai, Mizuho; and Iida, Hideyo, 5,009,928, Cl. 427-126.300.

Japan Aviation Electronics Industry Limited: *See*—
Okada, Kenichi; Nishino, Masashi; and Tanigawa, Shu, 5,009,480, Cl. 350-96.150.
Sasaki, Hiroyuki; Shimamura, Masato; Noda, Juichi; Hanafusa, Hiroaki; and Takeuchi, Yoshiaki, 5,009,478, Cl. 350-96.150.

Japan Synthetic Rubber Co., Ltd.: *See*—
Umeda, Itsuki; Takashima, Masaaki; Zama, Yoshiaki; Takemura, Yasuhiko; Funabashi, Yuichi; Watanabe, Junichiro; Takeda, Kiyoshi; and Matsumoto, Makoto, 5,010,137, Cl. 525-104.000.

Jarrett, Guy R. Separable multi-layered wiping mitten. 5,008,969, Cl. 15-227.000.

Jautelat, Manfred: *See*—
Kramer, Wolfgang; Jautelat, Manfred; and Kranz, Eckart, 5,010,208, Cl. 548-267.800.

Jaynes, Craig B.: *See*—
Abu-Isa, Ismat A.; Eusebi, Elio; Jaynes, Craig B.; Moran, Susan C.; and Roy, Michael A., 5,009,827, Cl. 264-156.000.

JBH Ventures: *See*—
Bigari, Steven T., 5,010,485, Cl. 364-408.000.

Jelp, Inc.: *See*—
Mosele, John L.; and Stolpe, Lars O., 5,010,336, Cl. 340-907.000.

Jennmar Corporation: *See*—
Stankus, John C., 5,009,549, Cl. 405-261.000.

Jidosha Kiki Co., Ltd.: *See*—
Kushiyama, Takashi; and Kurihara, Yoshiyasu, 5,009,581, Cl. 417-540.000.

Jing, Gan: *See*—
Pei-gi, Mao; Jing, Gan; and Bing-huang, Que, 5,009,388, Cl. 251-65.000.

Jirkovsky, Ivo L.: *See*—
Felman, Steven W.; Jirkovsky, Ivo L.; and Memoli, Kevin A., 5,010,102, Cl. 514-473.000.

Jitsukawa, Masaharu: *See*—
Nishimoto, Akihiko; Hosoya, Yoshihiro; Tomita, Kunikazu; Urabe, Toshiaki; and Jitsukawa, Masaharu, 5,009,726, Cl. 148-111.000.

Jochum, Gunter, to General Motors Corporation. Air inlet chamber for a mixture former of a motor vehicle. 5,009,681, Cl. 55-416.000.

Joergensen, Tage W.; and Christensen, Leif, to Slagteriernes Forskningsinstitut. System for the stalling of animals. 5,009,191, Cl. 119-20.000.

Johansen, Keld; Pedersen, Erik; and Tops e, Haldor F. A., to Haldor Topsoe A/S. Method for the preparation of superconducting products. 5,010,054, Cl. 505-1.000.

Johansen, Oddvar: *See*—
Steele, John; Johansen, Oddvar; Johnson, Graham; and Hodgkin, Johnathon, 5,010,009, Cl. 435-240.243.

Johansson, Ernst. Multiple cyclone separator. 5,009,684, Cl. 55-340.000.

Johansson, Lars: *See*—
Carlsson, Anders; Johansson, Lars; and Soderlund, Frits, 5,009,583, Cl. 418-104.000.

Johansson, Mats, to Diaglobe Aktiebolag. Annular saw blade and annular saw with driving means for a saw blade. 5,009,011, Cl. 30-389.000.

Johinke, Bruce L., to South Australian Co-Operative Bulk Handling Limited. Reducing hoop stress in silos. 5,009,046, Cl. 52-197.000.

John Crane U.K. Limited: *See*—
Back, Anthony C., 5,009,437, Cl. 277-88.000.

John D. Brush & Co., Inc.: *See*—
Beattie, Patrick J.; Oliveri, Andrew L.; and Sylvester, Richard J., 5,009,090, Cl. 70-326.000.

John, Thomas; and Bock, Georg, to MAN Roland Druckmaschinen AG. Offset printing machine system. 5,009,158, Cl. 101-219.000.

John Wyeth and Brothers Limited: *See*—
Sheperd, Robin G., 5,010,196, Cl. 544-335.000.

Johnson, Bruce R., to Muskegon Automation Equipment, Inc. Brake shoe rivet press. 5,008,995, Cl. 29-252.000.

Johnson, Delwin O., to General Dynamics Corporation. Ultrasonic cure monitoring of advanced composites. 5,009,104, Cl. 73-597.000.

Johnson, Graham: *See*—
Steele, John; Johansen, Oddvar; Johnson, Graham; and Hodgkin, Johnathon, 5,010,009, Cl. 435-240.243.

Johnson, Harlan B.; Wiedrich, Charles R.; Allen, Ernie L.; and Howell, Peter P., to PPG Industries, Inc. Calcium hypochlorite article. 5,009,806, Cl. 252-187.280.

Johnson, Harlan B.; Laferty, Samuel B.; Wagner, Melvin P.; and Mohnot, Shantilal M., to PPG Industries, Inc. Gas recombinant separator. 5,009,971, Cl. 429-252.000.

Johnson, Hewitt M. Fireplace log holder and alarm. 5,009,217, Cl. 126-152.00B.

Johnson, Peter W.: *See*—
Waddington, Keith J.; and Johnson, Peter W., 5,009,935, Cl. 428-457.000.

Johnson, Richard E.; Kabcenell, Amy R.; and DeLuca, Joan S., to Motorola, Inc. Multiple messaging using a single selective call address. 5,010,547, Cl. 370-94.100.

Johnson, Roscoe F. Oil spill control. 5,009,179, Cl. 114-229.000.

Jokipalo, Pertti: *See*—
Maenpaa, Matti; Lehtoluoma, Teuvo; Henttinen, Kauko; Jokipalo, Pertti; Saren, Aimo; and Pirinen, Seppo, 5,009,096, Cl. 72-239.000.

Jollenbeck, Martin; Berendt, Hans-Ulrich; and Fringeli, Werner, to Ciba-Geigy Corporation. Aqueous dispensions of 2-(2'-hydroxyphenyl)benzotriazoles. 5,009,669, Cl. 8-573.000.

Jones, David P.: *See*—
Wanger, Mark E.; Methlie, Jennifer L.; Christie, Leslie G.; Dauner, Daniel R.; Domel, Douglas R.; Jones, David P.; Oliver, Thomas C.; and Stavely, Donald J., 5,010,536, Cl. 369-36.000.

Jones, James R., Jr. Radar simulator. 5,010,342, Cl. 342-169.000.

Jones, Marianne: *See*—
Lipkin, Charles L.; and Jones, Marianne, 5,010,350, Cl. 343-704.000.

Jones, Richard L., to Conoco Inc. Process for producing a petroleum wax composition. 5,010,126, Cl. 524-349.000.

Jones, William R., Jr., to Columbian Chemicals Company. Axial reactor with coaxial oil injection. 5,009,854, Cl. 422-150.000.

Jonker, Robert G. C. Display device for flat articles. 5,009,335, Cl. 211-55.000.

Jons, Roena B., to Braun, Anthony E., a part interest. Method of storing thread in an embroidery thread-holder. 5,009,054, Cl. 53-397.000.

Judy, Millard M.: *See*—
Morgan, Cheryle I.; and Judy, Millard M., 5,009,652, Cl. 604-385.100.

Juki Corporation: *See*—
Taguchi, Katsuhiko; and Mitsumori, Kazuya, 5,010,427, Cl. 360-99.050.

Julian, John C.; and Phelps, David S., to Lamb-Weston, Inc. Blade assembly for slicing food products. 5,009,141, Cl. 83-857.000.

Julie Associates, Inc.: *See*—
Preston, Wallace, 5,008,968, Cl. 15-1.510.

Jung, Herbert: *See*—
Wullenweber, Heinz; Kohl, Peter; Jung, Herbert; Borchardt, Jurgen; Bickle, Wolfgang; and Braus, Jurgen, 5,010,050, Cl. 502-301.000.

Jung, Johann: *See*—
Keil, Michael; Schirmer, Ulrich; Kast, Juergen; Kolassa, Dieter; Wuerzer, Bruno; Meyer, Norbert; Rademacher, Wilhelm; Jung, Johann; and Carlson, Dale R., 5,009,702, Cl. 71-100.000.

Jyouzuka, Masashi: *See*—
Ohmamyuda, Yukio; Tanabe, Toru; Matsumoto, Osamu; Suzuki, Hidenobu; and Jyouzuka, Masashi, 5,010,457, Cl. 362-66.000.

Kabcenell, Amy R.: *See*—
Johnson, Richard E.; Kabcenell, Amy R.; and DeLuca, Joan S., 5,010,547, Cl. 370-94.100.

Kabushiki Kaisha Kenwood: *See*—
Katou, Hiromi; and Kobayahsi, Hirokazu, 5,010,549, Cl. 370-110.100.

Kabushiki Kaisha Kobe Seiko Sho: *See*—
Uehara, Katsuhiro; Kurita, Masanori; and Murakami, Masakazu, 5,009,584, Cl. 425-135.000.

Kabushiki Kaisha Maruzen Shokuhin: *See*—
Ogawa, Ikuzo, 5,009,915, Cl. 426-615.000.

Kabushiki Kaisha Sangi: *See*—
Sakuma, Shuji; Atsumi, Kiminori; and Fujita, Keijiro, 5,009,898, Cl. 424-618.000.

Kabushiki Kaisha Showa Seisakusho: *See*—
Hayashi, Yasuyuki; and Abe, Shigenobu, 5,009,451, Cl. 280-724.000.

Kabushiki Kaisha Toshiba: *See*—
Asai, Kenji, 5,010,425, Cl. 360-78.040.
Kanno, Masayuki, 5,010,581, Cl. 382-56.000.
Katoh, Riichi, 5,010,382, Cl. 357-34.000.
Matsui, Masataka, 5,010,521, Cl. 365-189.010.
Minagawa, Hidenobu; Tatsumi, Yuuichi; Iwahashi, Hiroshi; Asano, Masamichi; Nakai, Hiroto; and Imai, Mizuho, 5,010,520, Cl. 365-174.000.
Minami, Fumihiro, 5,010,031, Cl. 437-51.000.
Moore, John F., 5,010,254, Cl. 250-551.000.
Ohkoshi, Seizi; and Kuwahara, Eiji, 5,009,078, Cl. 62-160.000.
Okoshi, Seiji; and Kuwahara, Eiji, 5,009,077, Cl. 62-160.000.
Oto, Hideki, 5,010,400, Cl. 358-86.000.
Sakanishi, Masayuki; and Ishii, Takaaki, 5,010,577, Cl. 381-104.000.
Shioyama, Tsutomu; Minakami, Ko; Fujii, Takao; and Ohtomi, Koichi, 5,009,838, Cl. 376-310.000.
Takeuchi, Ryoji, 5,010,541, Cl. 369-107.000.
Tanaka, Shigeru, 5,010,390, Cl. 357-72.000.
Toda, Haruki, 5,010,518, Cl. 365-145.000.
Tokiwa, Yukio; Ichikawa, Fumitoshi; Nakamura, Naomi; Hirose, Syunichi; and Inokuchi, Haruhisa, 5,010,467, Cl. 363-37.000.
Ueda, Makoto; Ando, Yoshihira; Sakurai, Shungo; and Yoshioka, Ritsuo, 5,009,840, Cl. 376-435.000.
Usami, Kimiyoshi; and Ishii, Aya, 5,010,258, Cl. 307-469.000.
Yamada, Takehito; Tanimoto, Kazushi; Sakai, Yuji; Muraoka, Takao; Inoue, Tetsuo; and Takada, Yoshinao, 5,010,430, Cl. 360-103.000.

Kabushiki Kaisha Toyoda Jidoshokki Seisakushi: *See*—
Ikeda, Hayato; Sawada, Masahiro; Nakamura, Norihiko; and Yokomachi, Naoya, 5,009,286, Cl. 184-6.170.

Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See*—
Ikeda, Hayato; Sawada, Masahiro; and Nakamura, Norihiko, 5,009,574, Cl. 417-222.000.

Kabushiki Kaisha Toyoseiakusho: *See*—
Koga, Shigeyuki; and Sugiue, Shigeki, 5,009,172, Cl. 110-242.000.

Kabushikikaisha Kaichu Kyoju Kenkyu-sho: *See*—
Yasui, Mitsuo, 5,009,188, Cl. 119-3.000.

Kadono, Osamu; and Ushizima, Kunio, to Hitachi, Ltd. Automatic cash transaction system and method. 5,010,238, Cl. 235-379.000.

Kadoya, Tadaaki: *See*—
Mori, Kinji; Kunai, Yuko; Akiyama, Masakazu; Kadoya, Tadaaki; Kawano, Katsumi; Miyamoto, Shoji; Nohmi, Makoto; Shingai, Sadanori; and Ihara, Hirokazu, 5,010,479, Cl. 364-200.000.

Kafka, Bernard; and Baufume, Michel, to Isover Saint-Gobain. Substrate for soil-free culture having a controlled water content over its thickness. 5,009,030, Cl. 47-64.000.

Kageyama, Hidehei, to Kotobuki & Co., Ltd. Propelling pencil with cushion sleeve. 5,009,533, Cl. 401-65.000.

Kaji, Joel T. Device and method for bundling. 5,009,153, Cl. 100-2.000.

Kaji, Toshio: *See*—
Kinoshita, Takao; Tojo, Akihiko; Takayama, Tsutomu; Kaji, Toshio; and Tanaka, Nobuyoshi, 5,010,418, Cl. 358-335.000.

Kakinuma, Yuji: *See*—
Fukushima, Yoichi; Fujita, Minoru; Kakinuma, Yuji; and Haga, Toshio, 5,010,243, Cl. 235-488.000.

Kakiuchi, Shinichi: *See*—
Yamagishi, Hisashi; Kakiuchi, Shinichi; and Tomita, Seisuke, 5,009,428, Cl. 273-232.000.

Kalfoglou, George, to Texaco Inc. Method of using a combination lignosulfonate/polyalkylene glycol system as a sacrificial agent for surfactant flooding. 5,009,268, Cl. 166-274.000.

Kali-Chemie AG: *See*—
Schwetje, Norbert; Sizmann, Rudolf; and Khelifa, Noureddine, 5,009,071, Cl. 62-4.000.

Kali-Chemie Pharma GmbH: *See*—
Waldeck, Harald; Benson, Werner; Zeugner, Horst; Wolf, Klaus-Ullrich; Gregory, Peter-Colin; Hamminga, Derk; and van Wijngaarden, Ineke, 5,010,076, Cl. 514-221.000.

Kalina, Jaroslav: *See*—
Pajgrt, Jan; Smetak, Vincenc; Kalina, Jaroslav; Zemek, Michal; Pus, Milan; and Bucek, Pavel, 5,009,253, Cl. 139-116.200.

Kalman, Thomas I., to Research Foundation of State University of N.Y.. The. Compositions and methods comprising 2-mercaptomethyiglutaric acid derivatives. 5,010,103, Cl. 514-495.000.

Kalotay, Paul; Bruck, Robert; Emch, Arnold; and Martella, Donald, to Micro Motion, Inc. Flow tube drive circuit having a bursty output for use in a coriolis meter. 5,009,109, Cl. 73-861.380.

Kalter, Howard L.: *See*—
Fifield, John A.; and Kalter, Howard L., 5,010,524, Cl. 365-205.000.

Kamayachi, Yuichi; and Inagaki, Syoji, to Taiyo Ink Manufacturing Co., Ltd. Resist ink composition. 5,009,982, Cl. 430-280.000.

Kamei, Yasuo: *See*—
Akizawa, Nobuyuki; Kudo, Yasunori; Kanai, Toshiyuki; Kamei, Yasuo; Oyama, Nobuaki; and Negishi, Akihito, 5,009,355, Cl. 227-114.000.

Kameyama, Fumio; and Hattori, Chikamasa, to Brother Kogyo Kabushiki Kaisha. Machine tool. 5,009,554, Cl. 409-231.000.

Kamijo, Eiji: *See*—
Ogata, Kiyoshi; Ando, Yasunori; and Kamijo, Eiji, 5,009,923, Cl. 427-38.000.

Kamio, Hiroshi: *See*—
Shima, Yoshinobu; and Kamio, Hiroshi, 5,009,863, Cl. 422-249.000.

Kamishioiri, Nobuyuki; Kaneda, Manabu; Tanaami, Toshiyasu; and Maeda, Miho, to Kao Corporation. Surface material for sanitary articles and its preparing method. 5,009,651, Cl. 604-378.000.

Kamiya, Takashi: *See*—
Yamauchi, Hiroshi; Sugiyama, Isao; Saito, Isao; Nomoto, Seiichiro; Kamiya, Takashi; Machida, Yoshimasa; and Negi, Shigeto, 5,010,188, Cl. 540-222.000.

Kamiyama, Masayuki: *See*—
Aoki, Masaaki; Kamiyama, Masayuki; Asai, Kiyotsugu; and Yamaguchi, Akihiro, 5,010,161, Cl. 528-59.000.

Kamizawa, Koh: *See*—
Murakami, Tokumichi; Asai, Kohtaro; Kamizawa, Koh; Nishida, Masami; Yamazaki, Eizo; Itoh, Atsushi; and Kinjoh, Naoto, 5,010,401, Cl. 358-136.000.

Kamrat, Esko, to Janesko Oy. Arrangement for displacing a measuring head of a measuring means into and from a process space. 5,009,113, Cl. 73-866.500.

Kanai, Seita: *See*—
Edahiro, Takeshi; and Kanai, Seita, 5,009,449, Cl. 280-690.000.

Kanai, Toshiyuki: *See*—
Akizawa, Nobuyuki; Kudo, Yasunori; Kanai, Toshiyuki; Kamei, Yasuo; Oyama, Nobuaki; and Negishi, Akihito, 5,009,355, Cl. 227-114.000.

Kanaya, Yasuhiko: *See*—
Arai, Kunio; and Kanaya, Yasuhiko, 5,010,232, Cl. 219-121.700.

Kanda, Makoto: *See*—
Mitarai, Tadashi; and Kanda, Makoto, 5,009,590, Cl. 432-121.000.

Kanda, Takashi: *See*—
Hasegawa, Takanori; Abe, Nobuyuki; Hibara, Toru; Hirose, Toshihiko; Kanda, Takashi; Saito, Hiroshi; Oshima, Masaki; and Nakazawa, Eiji, 5,010,420, Cl. 358-471.000.

Kandachi, Takayoshi, to Central Glass Company, Limited. Sintered glass body with opaquely mottled pattern and method of producing same. 5,010,042, Cl. 501-32.000.

Kane, John M.: *See*—
Palfreyman, Michael G.; Wiech, Norbert L.; Cheng, Hsien C.; and Kane, John M., 5,010,072, Cl. 514-183.000.

Kaneda, Manabu: *See*—
Kamishioiri, Nobuyuki; Kaneda, Manabu; Tanaami, Toshiyasu; and Maeda, Miho, 5,009,651, Cl. 604-378.000.

Kanehira, Makoto; Nakagawa, Takerou; Tsubakimoto, Yasumasa; Tanaka, Kouji; Takahashi, Toshio; and Ikeda, Masaaki, to Tsubakimoto Chain Co. Chain formed by link elements of identical shape. 5,009,630, Cl. 474-211.000.

Kanehisa, Osam: *See*—
Migita, Masahito; Uda, Tsuyoshi; Kanehisa, Osam; and Shiiki, Masatoshi, 5,010,517, Cl. 365-114.000.

Kaneko, Toshimi; Morinaga, Tetsuya; and Hatakenaka, Tetsuo, to Murata Manufacturing Co., Ltd. Chip coil. 5,010,313, Cl. 335-296.000.

Kaneshige, Masatoshi: *See*—
Asanuma, Masato; and Kaneshige, Masatoshi, 5,009,187, Cl. 118-658.000.

Kang, Sung H., to Sung Ho Korea Company. Electronic switching ballast for a fluorescent lamp. 5,010,278, Cl. 315-224.000.

Kanno, Masayuki, to Kabushiki Kaisha Toshiba. Data processing apparatus having function for retrieving abstract and original image data. 5,010,581, Cl. 382-56.000.

Kansai Paint Co., Ltd.: *See*—
Morita, Kaoru; and Shioda, Atsushi, 5,010,149, Cl. 525-481.000.

Kao Corporation: *See*—
Kamishioiri, Nobuyuki; Kaneda, Manabu; Tanaami, Toshiyasu; and Maeda, Miho, 5,009,651, Cl. 604-378.000.
Watanabe, Taichi; Ogino, Hidekazu; Hirota, Hajime; Koshika, Tomohito; Moriya, Naoko; and Nozaki, Toshio, 5,009,813, Cl. 252-545.000.

Kappas, Attallah; and Drummond, George S., to Rockefeller University, The. Use of liposomes as carriers for metalloporphyrins. 5,010,073, Cl. 514-185.000.

Karasawa, Akira: *See*—
Oshima, Etsuo; Obase, Hiroyuki; Karasawa, Akira; Kubo, Kazuhiro; Miki, Ichiro; and Ishii, Akio, 5,010,087, Cl. 514-307.000.
Oshima, Etsuo; Obase, Hiroyuki; Karasawa, Akira; Kubo, Kazuhiro; Miki, Ichiro; and Ishii, Akio, 5,010,104, Cl. 514-510.000.

Karg, Kenneth A.; Hvozda, Carl K.; Neddermeyer, Robert N.; and Feld, Alexander, to AEG Westinghouse Transportation Systems, Inc. Vehicle air exchange according to passenger load. 5,009,148, Cl. 98-10.000.

Karl H. Sengewald KG: *See*—
Kruessel, Bernhard, 5,009,632, Cl. 493-189.000.

Karl Lautenschlager GmbH & Co. KG: *See*—
Lautenschlager, Karl; and Lautenschlager, Gerhard W., 5,008,977, Cl. 16-278.000.

Karl Storz Endoscopy-America, Inc.: *See*—
Damgaard-Iversen, Karsten; Morris, Robert C.; Chin, Timothy C.; and Kuper, Jerry W., 5,009,658, Cl. 606-128.000.

Karlsson, Markku: *See*—
LePisto, Matti; Ilmanen, Reijo; Karlsson, Markku; and Laakso, Sauli, 5,009,016, Cl. 34-41.000.

Karn, Donald L.: *See*—
Goodwin, Brent E.; Karn, Donald L.; and Mistyurik, John D., 5,009,739, Cl. 156-384.000.

Karsner, Grant G.: *See*—
Bartilucci, Mark P.; Karsner, Grant G.; and Tracy, William J., III, 5,009,767, Cl. 208-85.000.

Kasahara, Nobuo; Watanuki, Masayoshi; Maeno, Satoru; and Ohkuni, Masato, to Ricoh Company, Ltd.; and Shinko Electric Co., Ltd. Black-and-white and color copier operable at different processing speeds. 5,010,372, Cl. 355-313.000.

Kashuba, Glen A.: *See*—
Van Syckle, Peter B.; and Kashuba, Glen A., 5,009,666, Cl. 623-23.000.

Kast, Juergen: *See*—
Keil, Michael; Schirmer, Ulrich; Kast, Juergen; Kolassa, Dieter; Wuerzer, Bruno; Meyer, Norbert; Rademacher, Wilhelm; Jung, Johann; and Carlson, Dale R., 5,009,702, Cl. 71-100.000.

Katagawa, Hiromi, to Matsushita Electric Industrial Co., Ltd. Telephone-call distributor. 5,010,569, Cl. 379-210.000.

Katagiri, Shoichi: *See*—
Yoshio, Junichi; Hosaka, Sumio; Matsuoka, Hisao; Tsuda, Youichirou; Katagiri, Shoichi; and Nomura, Satoru, 5,010,417, Cl. 358-335.000.

Katahashi, Eriko: *See*—
Matsubara, Shinichi; Uehara, Masafumi; Bunya, Shinichi; and Katahashi, Eriko, 5,009,981, Cl. 430-175.000.

Katamoto, Tsutomu: *See*—
Tamari, Kousaku; and Katamoto, Tsutomu, 5,009,712, Cl. 106-456.000.

Katcherian, Ricky V., to General Motors Corporation. Window reveal molding. 5,009,462, Cl. 296-201.000.

Kato, Eiichi; and Ishii, Kazuo, to Fuji Photo Film Co., Ltd. Electrophotographic photoreceptor. 5,009,975, Cl. 430-96.000.

Kato, Eiji: *See*—
Harada, Kyouji; Kato, Eiji; Sakaguchi, Yoshikazu; Watanabe, Suzuaki; and Hoshino, Akira, 5,009,290, Cl. 188-71.500.

Kato, Masaaki, to Fujitsu Limited. Packet switching system. 5,010,546, Cl. 370-85.110.

Kato, Mikio: *See*—
Kuzuya, Susumu; Shimizu, Seiji; Kato, Mikio; Ishikawa, Yujiro; Sakai, Takashi; and Yuki, Eiji, 5,009,530, Cl. 400-188.000.

Kato, Osami: *See*—
Otsuki, Hajime; Kusano, Hideaki; and Kato, Osami, 5,010,362, Cl. 355-74.000.
Kato, Rentaro; and Suzuki, Tatsuya, to Tokai Rubber Industries, Ltd. Fluid-filled elastic mount. 5,009,403, Cl. 267-140.100.
Kato, Takafumi, to Alps Electric Co., Ltd. Push button switch with actuator for applying transverse force to buckling spring. 5,010,219, Cl. 200-408.000.
Katoh, Riichi, to Kabushiki Kaisha Toshiba. Heterojunction bipolar transistor having double hetero structure. 5,010,382, Cl. 357-34.000.
Katoh, Takayuki, to Mitsubishi Denki Kabushiki Kaisha. Method of making a semiconductor device operating in high frequency range. 5,010,019, Cl. 437-8.000.
Katou, Hiromi; and Kobayahsi, Hirokazu, to Kabushiki Kaisha Kenwood. Packet data generator. 5,010,549, Cl. 370-110.100.
Katz, Frances R.: *See*—
Mauro, David J.; Furcsik, Susan L.; Katz, Frances R.; Faron, Eugene J., II; Gottneid, David J.; and Pustek, Frank J., 5,009,911, Cl. 426-578.000.
Katz, Marcella M. Human lifelike dolls, mannequins and humanoids and pet animal dolls and methods of individualizing and personalizing same. 5,009,626, Cl. 446-391.000.
Katz, Michael. Method of evaluating meconium content of amniotic fluid. 5,009,507, Cl. 356-421.000.
Katz, Murray: *See*—
Guthrie, Robin J.; Katz, Murray; and Schroll, Craig R., 5,009,968, Cl. 429-26.000.
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Sugimoto, Atsushi; Nakano, Osamu; Yasuda, Shigeru; Maeda, Chikatoshi; Ozone, Toshio; and Kawagoe, Makoto, 5,009,843, Cl. 420-112.000.
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KB Lighting, Inc.: *See*—
Weber, Walter K., 5,009,325, Cl. 220-374.000.
Keil, Michael; Schirmer, Ulrich; Kast, Juergen; Kolassa, Dieter; Wuerzer, Bruno; Meyer, Norbert; Rademacher, Wilhelm; Jung, Johann; and Carlson, Dale R., to BASF Aktiengesellschaft. Cyclohexenone compounds and use as herbicides or as plant growth regulators. 5,009,702, Cl. 71-100.000.
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Kelly, Kenneth C., to Hughes Aircraft Company. Slot radiator assembly with vane tuning. 5,010,351, Cl. 343-771.000.
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Wortley, Ronald W.; and Beattie, David C., 5,009,636, Cl. 604-43.000.
Kenny, Thomas J., to Westinghouse Electrical Corp. Sampled digital filter system. 5,010,507, Cl. 364-724.010.
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Keough, Laurence J., to Pitney Bowes Inc. Sorting system for organizing randomly ordered route grouped mail in delivery order sequence. 5,009,321, Cl. 209-3.100.
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Glockler, Gerhard; Muller, Heinz; Kepplinger, Leopold W.; Matzawrakos, Panajiotis; Koch, Erwin; and Auberger, Heinrich, 5,009,397, Cl. 266-197.000.
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Boden, Karl; Ibach, Harald; and Linke, Udo, 5,009,865, Cl. 422-249.000.
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Schwetje, Norbert; Sizmann, Rudolf; and Khelifa, Noureddine, 5,009,071, Cl. 62-4.000.
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Paton, Boris E.; Utkin, Vladimir F.; Nedoseka, Anatoly Y.; Khromyak, Nikolai T.; Gorlitsyn, Nikolai V.; Tikhy, Viktor G.; Mezintsev, Evgeny D.; and Mezhuev, Nikolai N., 5,010,503, Cl. 364-569.000.
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Grob, Ferdinand; Kienzler, Dieter; Linder, Ernst; Potschin, Roger; and Stutzenberger, Heinz, 5,009,064, Cl. 60-276.000.
Kigami, Takeo: *See*—
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Kihara, Hisashi: *See*—
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Killinger, Erich, to Dambach-Werke GmbH. Warning light device. 5,010,319, Cl. 340-472.000.
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Kruse, Jurgen M.; and Kimball, Donald B., Jr., 5,010,125, Cl. 524-308.000.
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Bernardin, Leo J., 5,009,650, Cl. 604-378.000.
Hossain, Shafi U.; and Blaney, Carol A., 5,009,745, Cl. 162-5.000.
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Nakamura, Kosei; Kono, Shinichi; Numai, Kazuhisa; and Kimijima, Masami, 5,010,286, Cl. 318-571.000.
Kimura, Kenji: *See*—
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Kimura, Niroshi: *See*—
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Vrzalik, John H., 5,008,965, Cl. 5-61.000.
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Kinjoh, Naoto: *See*—
Murakami, Tokumichi; Asai, Kohtaro; Kamizawa, Koh; Nishida, Masami; Yamazaki, Eizo; Itoh, Atsushi; and Kinjoh, Naoto, 5,010,401, Cl. 358-136.000.
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Kurakake, Mitsuo; and Kinoshita, Jiro, 5,010,492, Cl. 364-474.290.
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Kintz, Karl A.: *See*—
Liang, Rong-Chang; Colyer, Emerson K.; Chen, Jing-Den; Kintz, Karl A.; and Suen, Chih-Her, 5,010,114, Cl. 521-109.100.
Kinugawa Rubber Industrial Co., Ltd.: *See*—
Hasegawa, Minekazu; Ikeda, Keiichi; and Fujihira, Junichi, 5,009,464, Cl. 296-213.000.
Kippenhan, B. William; and Maholick, Andrew W., to International Business Machines Corporation. Structured fields at a data stream boundary for delimiting files. 5,010,514, Cl. 364-900.000.
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Sato, Kazuhiro; Kishi, Tomomi; Umeda, Koji; Uchida, Yasushi; and Takeuchi, Masahiko, 5,010,226, Cl. 219-81.000.
Kist, William J. Animal trap with sanitary handling means. 5,009,317, Cl. 206-466.000.
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Kubler, John M.; and Insalaco, Michael D., 5,009,106, Cl. 73-651.000.
Kita, Jean-Claude; Puff, Roger M.; Petrovic, Alexandre; and Chretien, Marcel, to Charbonnages de France. Cooled fluidization grid. 5,009,852, Cl. 422-143.000.
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Kitamura, Koichiro, to Kitamura Machinery Co., Ltd. Tool holder for machine tool. 5,009,555, Cl. 409-232.000.
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Kitamura, Koichiro, 5,009,555, Cl. 409-232.000.
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Kiuchi, Hiroyuki: *See*—
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Klaassens, J. Ben; Lauw, Hian K.; and de Beer, Freddy, to Frijouf, Robert F. Three-phase AC-to-AC series resonant power converter with reduced number of switches. 5,010,471, Cl. 363-160.000.
Klein, David C. Test tube cassette system and cassettes for use therein. 5,009,316, Cl. 206-443.000.
Kleinschmit, Peter: *See*—
Deschler, Ulrich; and Kleinschmit, Peter, 5,010,203, Cl. 548-110.000.
Klemen, Donald: *See*—
Ordo, James P.; Raszkowski, James A.; and Klemen, Donald, 5,009,116, Cl. 74-331.000.
Raszkowski, James A.; and Klemen, Donald, 5,009,118, Cl. 74-331.000.
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Kleschick, William A.: *See*—
Van Heertum, John C.; Gerwick, Ben C., III; and Kleschick, William A., 5,010,195, Cl. 544-263.000.
Klett, Paul A.; Bakhshi, Shiv K.; and Stahl, Steven B., to Owens-Corning Fiberglas Corporation. Method and apparatus for impregnating a porous substrate with foam. 5,009,932, Cl. 427-243.000.
Kline, Loren H.; Sherwin, Harry A.; and Telep, Robert J., to Coltec Industries Inc. Control module having multiple solenoid actuated valves. 5,009,250, Cl. 137-596.170.
Klok, Richard J.: *See*—
Rue, Charles V.; van de Merwe, Ronald H.; Bauer, Ralph; Pellow, Scott W.; Cottringer, Thomas E.; and Klok, Richard J., 5,009,676, Cl. 51-309.000.
Klotz, Gernot: *See*—
Lindel, Hans; Hallenbach, Werner; Berschauer, Friedrich; Greife, Heinrich; and Klotz, Gernot, 5,010,091, Cl. 514-357.000.
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Knighton, Nigel J.: *See*—
Storrow, Alan J.; and Knighton, Nigel J., 5,010,444, Cl. 361-386.000.
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Knopp, John V. Eigenvector synthesizer. 5,009,143, Cl. 84-604.000.
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Knudson, Steven B., to Advance Display Technologies, Inc. Image transfer device and method of manufacture. 5,009,475, Cl. 350-96.100.
Kobari, Tadaomi, to Alpine Electronics Inc. Printed circuit board. 5,010,448, Cl. 361-403.000.
Kobayahsi, Hirokazu: *See*—
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Kobayashi, Yoshiharu: *See*—
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Kobylarz, Daniel E.; and Ford, David K., to Motorola, Inc. Method for active feedback suppression. 5,010,570, Cl. 379-390.000.
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Koch, Erwin: *See*—
Glockler, Gerhard; Muller, Heinz; Kepplinger, Leopold W.; Matzawrakos, Panajiotis; Koch, Erwin; and Auberger, Heinrich, 5,009,397, Cl. 266-197.000.
Koch Industries, Inc.: *See*—
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Koch, Peter: *See*—
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Koegel, Keith S.: *See*—
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Koga, Shigeyuki; and Sugiue, Shigeki, to Kabushiki Kaisha Toyoseiakusho. Method for and apparatus of thermal treatment of human waste. 5,009,172, Cl. 110-242.000.
Kogelnik, Herwig W.: *See*—
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Morimoto, Yoshihiko; and Kohno, Tetsushi, 5,009,127, Cl. 74-866.000.
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Kohsaka, Masaki; Higashi, Isaburou; Akana, Yoshinori; Hashimoto, Mikio; and Yatsu, Tadao, to Mitsui Petrochemical Industries, Ltd. Polyester carbonate copolymers, processes for preparing same and polyester resin compositions containing said copolymers. 5,010,146, Cl. 525-439.000.
Koike, Atsushi: *See*—
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Koike, Seiji, to Tokyo Electric Co., Ltd. Color ink ribbon and printer using this ribbon. 5,009,531, Cl. 400-240.300.
Kojima, Hiroyasu: *See*—
Harano, Takeshi; Takaki, Satoru; Shigesato, Yuzo; Suzuki, Koichi; Hashimoto, Naoki; Kojima, Hiroyasu; and Oyama, Takuji, 5,009,922, Cl. 427-37.000.
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Kojima, Kunio: *See*—
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Kokusai Denshin Denwa Co., Ltd.: *See*—
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Kolassa, Dieter: *See*—
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Komakine, Shigeo: *See*—
Horii, Masami; Komakine, Shigeo; Ochiai, Kuniaki; and Kondoh, Takashi, 5,009,528, Cl. 400-124.000.
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Inoue, Yoshinori; Kumanoya, Masaki; Komatsu, Takahiro; Konishi, Yasuhiro; and Dosaka, Katsumi, 5,010,259, Cl. 307-482.000.
Komiya, Ryohei: *See*—
Yamamoto, Takemi; Nagata, Osamu; Komiya, Ryohei; Sakai, Jun; and Ban, Yoshiyuki, 5,010,360, Cl. 355-20.000.
Kondo, Masao: *See*—
Ishida, Takashi; and Kondo, Masao, 5,009,145, Cl. 84-612.000.
Kondo, Tomoji: *See*—
Kawakami, Toshikatsu; Fukuda, Shin; Shinbo, Hiroyasu; Unemura, Toyoaki; Sakamoto, Ken; and Kondo, Tomoji, 5,010,406, Cl. 358-147.000.
Kondoh, Takashi: *See*—
Horii, Masami; Komakine, Shigeo; Ochiai, Kuniaki; and Kondoh, Takashi, 5,009,528, Cl. 400-124.000.
Konica Corporation: *See*—
Maekawa, Yoshikazu; and Hirata, Tetsuo, 5,010,364, Cl. 355-207.000.
Matsubara, Shinichi; Uehara, Masafumi; Bunya, Shinichi; and Katahashi, Eriko, 5,009,981, Cl. 430-175.000.
Murahashi, Takashi; Nakazawa, Toshihiko; Takesue, Toshihiro; and Motoi, Toshihiro, 5,010,353, Cl. 346-108.000.
Yagi, Toshihiko; and Yamada, Yoshitaka, 5,009,988, Cl. 430-505.000.
Konishi, Yasuhiro: *See*—
Inoue, Yoshinori; Kumanoya, Masaki; Komatsu, Takahiro; Konishi, Yasuhiro; and Dosaka, Katsumi, 5,010,259, Cl. 307-482.000.
Kono, Shinichi: *See*—
Nakamura, Kosei; Kono, Shinichi; Numai, Kazuhisa; and Kimijima, Masami, 5,010,286, Cl. 318-571.000.
Konse, Hiroaki: *See*—
Yamanaka, Masahiko; Hanaoka, Motoyoshi; Konse, Hiroaki; Shigeno, Haruhisa; and Kinoshita, Masakatsu, 5,009,936, Cl. 427-407.100.
Koppensteiner, Alfred: *See*—
Iossi, Daryl R.; Cook, Lacy G.; and Koppensteiner, Alfred, 5,009,494, Cl. 350-620.000.
Korber AG: *See*—
Heitmann, Uwe, 5,009,238, Cl. 131-108.000.
Koshika, Tomohito: *See*—
Watanabe, Taichi; Ogino, Hidekazu; Hirota, Hajime; Koshika, Tomohito; Moriya, Naoko; and Nozaki, Toshio, 5,009,813, Cl. 252-545.000.
Kosin, John A.; Mooney, Gerry; Tarquini, Michael A.; and Garcia, Rod A., to J. M. Huber Corporation. High temperature endothermic blowing agents compositions and applications. 5,009,809, Cl. 252-350.000.
Kosin, John A.: *See*—
Wason, Satish K.; Mooney, Gerry; Andrews, Claude R.; Tarquini, Michael E.; Kosin, John A.; and Garcia, Rod A., 5,009,810, Cl. 252-350.000.
Koski, Greg, to R.W. Technology, Inc. Plastic-rubber composites. 5,010,122, Cl. 524-80.000.
Kosugi, Yoshitsugu; Tanaka, Hideoki; Suzuki, Hideo; and Shiraki, Masaru, to Agency of Industrial Science & Technology; and Ministry of International Trade & Industry. Method for continuous reaction with fluidized immobilized lipase. 5,010,004, Cl. 435-134.000.
Kotecki, Jeffrey D.: *See*—
Raikes, Terry E.; Kramer, William L.; Howard, John H.; Moore, Wayne D.; Jackson, Louis; and Kotecki, Jeffrey D., 5,009,276, Cl. 177-25.150.
Kotera, Nobukazu: *See*—
Yatsuka, Takeshi; Murata, Hiroshi; Mizumura, Yutaka; and Kotera, Nobukazu, 5,009,960, Cl. 428-423.100.
Kotobuki & Co., Ltd.: *See*—
Kageyama, Hidehei, 5,009,533, Cl. 401-65.000.
Kouno, Tomomitsu; Hatano, Hideki; Yamaji, Takashi; Ootaki, Sakashi; and Nishida, Masami, to Pioneer Electronic Corp. Photo-conductive liquid crystal light valve. 5,009,490, Cl. 350-342.000.
Kouzuki, Hiroyuki: *See*—
Naito, Yasuo; Kouzuki, Hiroyuki; and Murai, Takeshi, 5,010,490, Cl. 364-426.040.
Kovacs, Richard C.; Krambeck, Frederick J.; and Sarli, Michael S., to Mobil Oil Corporation. Fluid catalytic cracking regeneration with reduction of nitrogen oxide. 5,009,853, Cl. 422-144.000.
Kowdley, Balasubramanian S.: *See*—
Richardson, David L.; Clark, Jack P.; Kowdley, Balasubramanian S.; Patterson, Peter M.; Perry, Richard W.; and Smith, Thurman D., 5,009,105, Cl. 73-621.000.
Koyama, Akihiro; Kitamura, Keiji; and Yamamoto, Nobuyuki, to Nippon Sheet Glass Co., Ltd. Colored low-expansion transparent glass ceramic. 5,010,041, Cl. 501-4.000.
Koyama, Toshihide: *See*—
Kijima, Takao; Edahiro, Takeshi; Koyama, Toshihide; and Taniguchi, Haruyuki, 5,009,448, Cl. 280-673.000.
Kozikowski, Barbara A.: *See*—
Degenhardt, Charles R.; and Kozikowski, Barbara A., 5,009,882, Cl. 424-52.000.
Kozuki, Susumu: *See*—
Yasumura, Hiroto; Hirasawa, Masahide; Noji, Minoru; Kozuki, Susumu; Takahashi, Koji; and Yoshimura, Katsuji, 5,010,416, Cl. 358-314.000.
Kraft General Foods, Inc.: *See*—
Kratochvil, John F., 5,009,867, Cl. 426-128.000.
Wiant, Matthew J.; Lynch, William R.; and LeFreniere, Robert C., 5,009,917, Cl. 426-631.000.
Krambeck, Frederick J.: *See*—
Kovacs, Richard C.; Krambeck, Frederick J.; and Sarli, Michael S., 5,009,853, Cl. 422-144.000.
Kramer, William I. Packaging carton. 5,009,320, Cl. 206-607.000.
Kramer, William L.: *See*—
Raikes, Terry E.; Kramer, William L.; Howard, John H.; Moore, Wayne D.; Jackson, Louis; and Kotecki, Jeffrey D., 5,009,276, Cl. 177-25.150.
Kramer, Wolfgang; Weissmuller, Joachim; Berg, Dieter; Brandes, Wilhelm; and Dutzmann, Stefan, to Bayer Aktiengesellschaft. Pesticidal aminomethylheterocyclic compounds. 5,010,101, Cl. 514-462.000.
Kramer, Wolfgang; Jautelat, Manfred; and Kranz, Eckart, to Bayer Aktiengesellschaft. Novel alkylcycloalkyl triazolylmethyl ketones as fungicide intermediates. 5,010,208, Cl. 548-267.800.
Kranz, Eckart: *See*—
Kramer, Wolfgang; Jautelat, Manfred; and Kranz, Eckart, 5,010,208, Cl. 548-267.800.
Kratochvil, John F., to Kraft General Foods, Inc. C-gel composite pizza snack kit. 5,009,867, Cl. 426-128.000.
Krauss, Owen T.: *See*—
Gruber, Norman G.; and Krauss, Owen T., 5,009,100, Cl. 73-155.000.
Krebser, Werner; Lantos, Michael; and Kolta, Peter, to Harrier GmbH Gesellschaft fur den Vertrieb medizinischer und technischer Gerate.

Therapeutic lamp for biostimulation with polarized light. 5,010,452, Cl. 362-19.000.

Krempl, Peter W.; Wegscheider, Guenther; and Woess, Gerhard, to AVL Gesellschaft fuer Verbrennungs-kraftmaschinen und Messtechnik m.b.H., Prof. Dr. Dr. h.c. Hans List. Charge amplifier circuit. 5,010,302, Cl. 330-107.000.

Krenz, Horst M., to Zenith Data Systems Corporation. Installation mechanism for removable computer drive module. 5,010,426, Cl. 360-97.010.

Kreuter, Volker: *See*—
Gansauge, Peter; Kreuter, Volker; and Schettler, Helmut, 5,010,389, Cl. 357-67.000.

Kreuzer, Franz-Heinrich: *See*—
Wenski, Guido; Maier, Ludwig; and Kreuzer, Franz-Heinrich, 5,009,934, Cl. 427-387.000.

Kromrey, Robert V., to United Technologies Corporation. Method of molding a composite article using softened glass as a pressure transmitting medium. 5,009,687, Cl. 65-18.100.

Kromrey, Robert V., to United Technologies Corporation. Method of molding a carbon-carbon composite. 5,009,823, Cl. 264-29.700.

Kronfli, Esam; Lovell, Keith V.; Hooper, Alan; and Neat, Robin J., to United Kingdom Atomic Energy Authority. Polymer electrolytes. 5,009,970, Cl. 429-192.000.

Kruck, Richard W.; Cur, Omer N.; Leclear, Douglas D.; Kuehl, Steven J.; and Burin, Ralph R., to Whirlpool Corporation. Modular mechanical refrigeration unit. 5,009,081, Cl. 62-264.000.

Kruessel, Bernhard, to Karl H. Sengewald KG. Method and device for joining foil hoses. 5,009,632, Cl. 493-189.000.

Krumb, Heinrich W.: *See*—
Reichman, Karl-Heinz; and Krumb, Heinrich W., 5,010,456, Cl. 362-61.000.

Kruse, Heinz-Josef: *See*—
Sippel, Achim; Kruse, Heinz-Josef; and Becker, Wilfried, 5,009,167, Cl. 102-524.000.

Kruse, Jurgen M.; and Kimball, Donald B., Jr., to XAAR Limited. Room temperature plain paper ink. 5,010,125, Cl. 524-308.000.

Kruse, Rodger C.: *See*—
Scholsky, Kevin M.; Larsen, Lisa M.; and Kruse, Rodger C., 5,010,166, Cl. 528-323.000.

Ku, San-Mei; and Perry, Kathleen A. Method of forming contacts to a semiconductor device. 5,010,039, Cl. 437-228.000.

Kubler, John M.; and Insalaco, Michael D., to Kistler Instrumente AG. Accerlerometer with improved shock resistance. 5,009,106, Cl. 73-651.000.

Kubo, Kazuhiro: *See*—
Oshima, Etsuo; Obase, Hiroyuki; Karasawa, Akira; Kubo, Kazuhiro; Miki, Ichiro; and Ishii, Akio, 5,010,087, Cl. 514-307.000.
Oshima, Etsuo; Obase, Hiroyuki; Karasawa, Akira; Kubo, Kazuhiro; Miki, Ichiro; and Ishii, Akio, 5,010,104, Cl. 514-510.000.

Kubo, Shinji: *See*—
Yoshida, Keiji; Funato, Ryo; Takahiro, Syuji; Kubo, Shinji; and Inagaki, Notoshi, 5,009,978, Cl. 430-109.000.

Kubota Ltd.: *See*—
Machida, Satoshi; and Hattori, Akio, 5,009,125, Cl. 74-606.00R.

Kubota, Toshiaki: *See*—
Naganuma, Hiroshi; Sato, Kenji; Yamamoto, Masashi; Kubota, Toshiaki; Hayashi, Hiroshige; and Ishizaka, Yoshirou, 5,009,080, Cl. 62-256.000.

Kucher, Donald C.: *See*—
Kelley, Joseph M.; Kucher, Donald C.; and Mayurnik, George, 5,009,875, Cl. 423-477.000.

Kuchta, Richard, to Gerber Garment Technology, Inc. Track expander and method of use. 5,009,168, Cl. 104-172.100.

Kudo, Yasunori: *See*—
Akizawa, Nobuyuki; Kudo, Yasunori; Kanai, Toshiyuki; Kamei, Yasuo; Oyama, Nobuaki; and Negishi, Akihito, 5,009,355, Cl. 227-114.000.

Kudou, Osamu: *See*—
Kushida, Kazumitsu; Kudou, Osamu; Ogawa, Sumitaka; and Uike, Hiroshi, 5,009,211, Cl. 123-491.000.

Kuehl, Steven J.: *See*—
Kruck, Richard W.; Cur, Omer N.; Leclear, Douglas D.; Kuehl, Steven J.; and Burin, Ralph R., 5,009,081, Cl. 62-264.000.

Kugimiya, Shuzo: *See*—
Suzuki, Hitoshi; Shiotani, Shinobu; Tokunaga, Shinji; Hirai, Tokuyuki; Fukumochi, Yoji; Kugimiya, Shuzo; and Sata, Ichiko, 5,010,486, Cl. 364-419.000.

Kuhara, Takashi. Device for providing communication between water tanks of heat accumulation tank system. 5,009,261, Cl. 165-96.000.

Kuhl, Virgil F.; and Noll, Guenter, to Motorola, Inc. Clip assembly. 5,008,988, Cl. 24-510.000.

Kuki, Nobuyuki; Isomura, Yukio; Suzumura, Hirokazu; Sakakibara, Yoshikazu; and Ishihara, Hiroshi, to Aisin Seiki Kabushiki Kaisha. Window regulator apparatus. 5,009,035, Cl. 49-352.000.

Kulas, John I.: *See*—
Maric, Milan; and Kulas, John I., 5,009,271, Cl. 175-53.000.

Kulkarni, Padmakar v.: *See*—
Shah, Vipin D.; Kulkarni, Padmakar v.; and Miranda, Quirinus R., 5,009,997, Cl. 435-7.400.

Kulkarni, Padmaker V.: *See*—
Shah, Vipin D.; Kulkarni, Padmaker V.; and Miranda, Quirinus R., 5,009,996, Cl. 435-7.000.

Kulzer & Co. GmbH: *See*—
Schaefer, Roland, 5,009,597, Cl. 433-212.100.

Kumanoya, Masaki: *See*—
Inoue, Yoshinori; Kumanoya, Masaki; Komatsu, Takahiro; Konishi, Yasuhiro; and Dosaka, Katsumi, 5,010,259, Cl. 307-482.000.

Kumazawa, Satoru: *See*—
Enari, Hiroyuki; Kumazawa, Satoru; Shimizu, Susumu; Ito, Atsushi; Sato, Nobuo; and Saishoji, Toshihide, 5,010,206, Cl. 548-262.200.

Kunai, Yuko: *See*—
Mori, Kinji; Kunai, Yuko; Akiyama, Masakazu; Kadoya, Tadaaki; Kawano, Katsumi; Miyamoto, Shoji; Nohmi, Makoto; Shingai, Sadanori; and Ihara, Hirokazu, 5,010,479, Cl. 364-200.000.

Kunihiro, Shibuya: *See*—
Masasumi, Yana; Hitoshi, Nagato; Kiyoshi, Yamada; Shyoji, Ueno; and Kunihiro, Shibuya, 5,009,527, Cl. 400-120.000.

Kunitz, Friedrich-Wilhelm; and Wichmann, Ralf, to Agfa-Gevaert Aktiengesellschaft. Iron complexes and bleaching baths containing same. 5,009,985, Cl. 430-430.000.

Kunz, Reiner; Babl, Albert; Zahradnicek, Ales; and Dietrich, Rainer. Abrasives. 5,009,674, Cl. 51-295.000.

Kunz, Reiner; and Dietrich, Rainer, to Lonza LTD. Coated silicon carbide abrasive grain. 5,009,675, Cl. 51-295.000.

Kunze, Kenneth R.: *See*—
Leung, Peter K.; Steiger, Ronald P.; and Kunze, Kenneth R., 5,010,301, Cl. 324-376.000.

Kuo, Gee-Hong: *See*—
Lesher, George Y., deceased; Bacon, Edward R.; Singh, Baldev; and Kuo, Gee-Hong, 5,010,086, Cl. 514-303.000.

Kuper, Jerry W.: *See*—
Damgaard-Iversen, Karsten; Morris, Robert C.; Chin, Timothy C.; and Kuper, Jerry W., 5,009,658, Cl. 606-128.000.

Kurakake, Mitsuo; and Kinoshita, Jiro, to Fanuc Ltd. Spindle control system and numerical control apparatus. 5,010,492, Cl. 364-474.290.

Kuramochi, Kunio: *See*—
Komabayashi, Masashi; Kuramochi, Kunio; and Hijikata, Kenichi, 5,009,717, Cl. 136-201.000.

Kuraray Company Limited: *See*—
Hatomoto, Isamu; and Matsuo, Yoshiteru, 5,009,946, Cl. 428-87.000.

Kureha Kagaku Kogyo Kabushiki Kaishi: *See*—
Enari, Hiroyuki; Kumazawa, Satoru; Shimizu, Susumu; Ito, Atsushi; Sato, Nobuo; and Saishoji, Toshihide, 5,010,206, Cl. 548-262.200.

Kurihara, Yoshiyasu: *See*—
Kushiyama, Takashi; and Kurihara, Yoshiyasu, 5,009,581, Cl. 417-540.000.

Kurita, Masanori: *See*—
Uehara, Katsuhiro; Kurita, Masanori; and Murakami, Masakazu, 5,009,584, Cl. 425-135.000.

Kuroda, Takeshi: *See*—
Suzuki, Fumio; Kuroda, Takeshi; Nakasato, Yoshisuke; Ohmori, Kenji; and Manabe, Haruhiko, 5,010,084, Cl. 514-293.000.

Kurosawa, Kazuhito: *See*—
Hikita, Mitsutaka; Sumioka, Atsushi; Tabuchi, Toyoji; Kurosawa, Kazuhito; and Kinoshita, Tuneo, 5,010,269, Cl. 310-313.00B.

Kurpick, Daniel L.: *See*—
Redl, Robert F., 5,009,015, Cl. 33-409.000.

Kurrasch, Andrew J., to Herman Miller, Inc. Acoustic panel. 5,009,043, Cl. 52-145.000.

Kurtz, Noel T. Means and method for automatic resonance tuning. 5,009,142, Cl. 84-454.000.

Kurumada, Masakazu: *See*—
Kobayashi, Kazuo; Morikawa, Kiyoshi; Yamada, Yoshinori; Kurumada, Masakazu; and Sugihara, Masanori, 5,010,484, Cl. 369-77.200.

Kurushima, Masakazu: *See*—
Fukushima, Hideo; and Kurushima, Masakazu, 5,010,432, Cl. 360-108.000.

Kusano, Hideaki: *See*—
Otsuki, Hajime; Kusano, Hideaki; and Kato, Osami, 5,010,362, Cl. 355-74.000.

Kushida, Kazumitsu; Kudou, Osamu; Ogawa, Sumitaka; and Uike, Hiroshi, to Honda Giken Kogyo Kabushiki Kaisha. Fuel injection controlling device for two-cycle engine. 5,009,211, Cl. 123-491.000.

Kushiyama, Takashi; and Kurihara, Yoshiyasu, to Jidosha Kiki Co., Ltd. Fluid accumulator for anti-skid brakes. 5,009,581, Cl. 417-540.000.

Kuster, Hans-Werner; and Vanaschen, Luc, to Saint-Gobain Vitrage. Apparatus for producing two dimensionally bent glass. 5,009,695, Cl. 65-182.200.

Kusumoto, Ichirou: *See*—
Okada, Kazuhisa; and Kusumoto, Ichirou, 5,010,296, Cl. 324-158.00P.

Kutzavitch, Walter G.; and Rosenthal, Eugene J., to AT&T Bell Laboratories. Low cost digital amplitude regulator. 5,010,306, Cl. 330-284.000.

Kuwahara, Eiji: *See*—
Ohkoshi, Seizi; and Kuwahara, Eiji, 5,009,078, Cl. 62-160.000.
Okoshi, Seiji; and Kuwahara, Eiji, 5,009,077, Cl. 62-160.000.

Kuwayama, Hideki: *See*—
Harada, Kinji; Ikeda, Kyoichi; Kuwayama, Hideki; Kobayashi, Takashi; Nishikawa, Tadashi; Watanabe, Tetsuya; and Yoshida, Takashi, 5,009,108, Cl. 73-704.000.

Kuwayama, Wataru: *See*—
Sumi, Chiaki; and Kuwayama, Wataru, 5,010,212, Cl. 174-52.200.

Kuznetsova, Tatyana A.: *See—*
Fedin, Marat A.; Kuznetsova, Tatyana A.; Lysenkov, Viktor I.; Novikova, Svetlana A.; Savchuk, Valentin A.; Sedelnikov, Anatoly I.; Shabunya, Vera P.; Udarov, Boris G.; Tikhonova, Tatyana S.; Polyakova, Nina P.; and Paklin, Sergei I., 5,010,106, Cl. 514-546.000.

Kuznicki, William J.: *See—*
Schwendeman, Robert J.; and Kuznicki, William J., 5,010,317, Cl. 340-311.100.

Kuzunuki, Soshiro: *See—*
Yoneda, Kenzi; Ueshima, Takaaki; Kuzunuki, Soshiro; Morita, Yuzo; and Tobita, Toshimitsu, 5,010,472, Cl. 364-148.000.

Kuzuya, Susumu; Shimizu, Seiji; Kato, Mikio; Ishikawa, Yujiro; Sakai, Takashi; and Yuki, Eiji, to Brother Kogyo Kabushiki Kaisha. Apparatus for reverse recording image and covering by protective medium. 5,009,530, Cl. 400-188.000.

Kwang-sik, Lee; and Chul-woo, Kim, to Samsung Electron Devices Co., Ltd. ARC length changing apparatus is exposing device and method thereof. 5,010,464, Cl. 362-284.000.

Kwoka, Margaret N.: *See—*
Bottom, Carey B.; and Kwoka, Margaret N., 5,010,069, Cl. 514-166.000.

Kwon, Heemin: *See—*
Lee, Hsien-Che; Lee, Hui-Jung; Kwon, Heemin; and Liang, Jeanine, 5,010,504, Cl. 364-574.000.

Kyodo Printing Co., Ltd.: *See—*
Fukushima, Yoichi; Fujita, Minoru; Kakinuma, Yuji; and Haga, Toshio, 5,010,243, Cl. 235-488.000.

Kyowa Hakko Kogyo Co., Ltd.: *See—*
Oshima, Etsuo; Obase, Hiroyuki; Karasawa, Akira; Kubo, Kazuhiro; Miki, Ichiro; and Ishii, Akio, 5,010,087, Cl. 514-307.000.
Oshima, Etsuo; Obase, Hiroyuki; Karasawa, Akira; Kubo, Kazuhiro; Miki, Ichiro; and Ishii, Akio, 5,010,104, Cl. 514-510.000.
Suzuki, Fumio; Kuroda, Takeshi; Nakasato, Yoshisuke; Ohmori, Kenji; and Manabe, Haruhiko, 5,010,084, Cl. 514-293.000.

Laakso, Sauli: *See—*
LePisto, Matti; Ilmanen, Reijo; Karlsson, Markku; and Laakso, Sauli, 5,009,016, Cl. 34-41.000.

Laakso, Timo, to 3TL Trading Co. Method and a support arrangement in a roller vehicle to be steered by a roller mat. 5,009,278, Cl. 180-9.440.

LaCava, James E.: *See—*
Mobley, Dewey F.; Peterson, Robert G., Sr.; and LaCava, James E., 5,009,615, Cl. 439-595.000.

Lachenmeier, Andreas, to Viscosuisse S.A. Device and process for intermingling a bundle of threads using a turbulent air stream. 5,008,991, Cl. 28-271.000.

Laferty, Samuel B.: *See—*
Johnson, Harlan B.; Laferty, Samuel B.; Wagner, Melvin P.; and Mohnot, Shantilal M., 5,009,971, Cl. 429-252.000.

Lager, Kjell; Tarnstrom, Anders; Ostlund, Olov; and Driver, Joseph W., to Svenska Skatebox AB. Skate sharpening device. 5,009,039, Cl. 51-165.770.

Lai, John T.; and Filla, Deborah S., to B. F. Goodrich Company, The. Process for the preparation of an azonitrile dicarboxylic acid initiator in acetone having a low salt and low water content. 5,010,177, Cl. 534-586.000.

Lai, John T., to B. F. Goodrich Company, The. Process for the preparation of mixed azonitrile carboxylic acid initiators. 5,010,178, Cl. 534-586.000.

Lai, John T., to B. F. Goodrich Company, The. Process for the preparation of mixed, symmetrical azonitrile dicarboxylic dicyano acids and initiators. 5,010,179, Cl. 534-586.000.

Lake Shore, Inc.: *See—*
Alquist, John W., 5,009,353, Cl. 226-172.000.

Lam, William Y.; and Liesen, Gregory P., to Ethyl Corporation. Phenolic antioxidant composition. 5,009,802, Cl. 252-48.200.

Lamatsch, Hans; and Vanek, Dieter, to Siemens Aktiengesellschaft. Apparatus for electron beam welding of workpieces. 5,010,229, Cl. 219-121.210.

Lamb-Weston, Inc.: *See—*
Julian, John C.; and Phelps, David S., 5,009,141, Cl. 83-857.000.

Lambert, Peter M.: *See—*
Clayton, Simon N.; Lambert, Peter M.; and Wevers, Jean, 5,009,804, Cl. 252-90.000.

Lambert, Robert W.; Martin, Joseph A.; and Thomas, Gareth J., to Hoffmann-La Roche Inc. Method of treating herpes simplex viral infection employing pyrimidine derivatives. 5,010,060, Cl. 514-49.000.

Lampman, David A.: *See—*
Paley, Martyn N. J.; Murdoch, James B.; Lampman, David A.; and McNally, James M., 5,010,300, Cl. 324-309.000.

Lancaster, Charles E.: *See—*
Bailey, Thomas F.; Lancaster, Charles E.; and Lee, Richard, 5,009,265, Cl. 166-118.000.

Lanciani, Arlene J.: *See—*
Glicksman, Leon R.; and Lanciani, Arlene J., 5,010,112, Cl. 521-76.000.

Land O'Lakes, Inc.: *See—*
Miller, Bill L.; Perry, H. Bruce; and DeGregorio, Robert, 5,009,899, Cl. 426-2.000.

Landry, Christine J.: *See—*
Coltrain, Bradley K.; Ferrar, Wayne T.; and Landry, Christine J., 5,010,128, Cl. 524-405.000.

Lang, Armin; and Schweizer, Bernhard, to Zahnradfabrik Friedrichshafen, AG. Torque sensor, in particular for electric steering mechanism. 5,009,110, Cl. 73-862.330.

Langenbeck, Keith A.; and Kensinger, Jesse P., to Langenbeck, Keith A. Storage and transport tray and tray packing system. 5,009,053, Cl. 53-58.000.

Langer, Robert S.: *See—*
Ron, Eyal; Staubli, Andrea; and Langer, Robert S., 5,010,167, Cl. 528-328.000.

Langgard, Ulf R.; and Thurston, William E., to Interconnect Devices, Inc. Spring contact twister probe for testing electrical printed circuit boards. 5,009,613, Cl. 439-482.000.

Lantos, Michael: *See—*
Krebser, Werner; Lantos, Michael; and Kolta, Peter, 5,010,452, Cl. 362-19.000.

Lantzsch, Reinhard: *See—*
Maurer, Fritz; Lantzsch, Reinhard; Fiege, Helmut; and Schnatterer, Albert, 5,010,193, Cl. 544-243.000.

Lanxide Technology Company, LP.: *See—*
Newkirk, Marc S., 5,010,044, Cl. 501-93.000.

Larner, David J.; and Goodchild, Clive D., to Gec-Marconi Limited. Nuclear event detectors. 5,010,321, Cl. 340-600.000.

Larsen, Lisa M.: *See—*
Scholsky, Kevin M.; Larsen, Lisa M.; and Kruse, Rodger C., 5,010,166, Cl. 528-323.000.

LaserMike, Inc.: *See—*
Petrohilos, Harry G., 5,009,233, Cl. 128-666.000.

Lasinvast Svenska AB: *See—*
Eck, Berth, 5,009,456, Cl. 292-173.000.

Lathom, Michael S.; Gullixson, Bruce B.; and Sweat, Bruce P. Switched capacitive ballasts for discharge lamps. 5,010,279, Cl. 315-227.00R.

Latshaw, Harry E.: *See—*
Ordo, James P.; and Latshaw, Harry E., 5,009,117, Cl. 74-331.000.

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Lauks, Imants R., to I-Stat Corporation. Metal oxide electrodes. 5,009,766, Cl. 204-419.000.

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Bittler, Dieter; Laurent, Henry; Rach, Petra; and Topert, Michael, 5,010,071, Cl. 514-178.000.

Laurent, Michel; Doukhan, Marc; and Noualhaguet, Pierre, to General Electric CGR S.A. System for the suspension of a rotating anode of an x-ray tube with passive magnetic bearings. 5,010,563, Cl. 378-132.000.

Laurent, Philippe: *See—*
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Laurenzi, Robert J.: *See—*
Shirey, Roy D.; Nelson, Michael T.; and Laurenzi, Robert J., 5,010,224, Cl. 219-69.170.

Lautenschlager, Gerhard W.: *See—*
Lautenschlager, Karl; and Lautenschlager, Gerhard W., 5,008,977, Cl. 16-278.000.

Lautenschlager, Karl; and Lautenschlager, Gerhard W., to Karl Lautenschlager GmbH & Co. KG. Cabinet hinge with closing mechanism. 5,008,977, Cl. 16-278.000.

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Klaassens, J. Ben; Lauw, Hian K.; and de Beer, Freddy, 5,010,471, Cl. 363-160.000.

Law, Garry C.: *See—*
Fong, Chi-Ming; Chew, Wai-Kwok; and Law, Garry C., 5,009,603, Cl. 434-323.000.

Lawler, James A.: *See—*
Benin, Joshua; Di Maio, William G.; Morin, Carl F.; and Lawler, James A., 5,009,942, Cl. 428-36.600.

Lawrence, Lowell J.; Ruzo, Luis O.; and Olson, Gene L., to Pharmacology & Toxicology Research Lab. Method and apparatus for conducting field dissipation and leaching studies. 5,009,112, Cl. 73-866.000.

Lawrence, Ronald L.; and Miller, Mark R., to Miller, Mark R.; and Berling, Steven J. Dual liquid spraying assembly. 5,009,342, Cl. 222-136.000.

Laxmanan, Venkatasubramanian, to General Motors Corporation. Process for manufacturing spheroidal hypoeutectic aluminum alloy. 5,009,844, Cl. 420-548.000.

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Domenighetti, Domenico; and Layton, Jack, 5,009,546, Cl. 404-110.000.

LCE Partnership: *See—*
O'Lenick, Anthony J., Jr.; Miller, John C.; and Clumpner, J. Michael, 5,010,173, Cl. 528-408.000.

Leach, David J., to Pandrol Jackson, Inc. Railroad rail profile measuring system. 5,009,014, Cl. 33-287.000.

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Leben, David G. Container and improved method for carrying and transporting computer tape cartridges. 5,009,312, Cl. 206-387.000.

LeBlanc, Peter E., to Beloit Corporation. Pulseless screen. 5,009,774, Cl. 209-273.000.

Leclear, Douglas D.: *See—*
Kruck, Richard W.; Cur, Omer N.; Leclear, Douglas D.; Kuehl, Steven J.; and Burin, Ralph R., 5,009,081, Cl. 62-264.000.

Lee, Chi-Ho: *See*—
Pascal, Jean C.; Lee, Chi-Ho; Alps, Brian J.; Pinhas, Henri; and Whiting, Roger L., 5,010,075, Cl. 514-218.000.
Lee, Chi-Long; and Willis, Robin L., Jr., to Dow Corning Corporation. Microencapsulated platinum-group metals and compounds thereof. 5,009,957, Cl. 428-402.220.
Lee, Ernest D., to Westinghouse Electric Corp. Fused salt process for purifying zirconium and/or hafnium tetrachlorides. 5,009,866, Cl. 423-73.000.
Lee, Guo-Shin. Fishing rod holder. 5,009,027, Cl. 43-21.200.
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Sacks, Michael D.; and Lee, Hae-Weon, 5,009,822, Cl. 264-23.000.
Lee, Hsien-Che; Lee, Hui-Jung; Kwon, Heemin; and Liang, Jeanine, to Eastman Kodak Company. Digital image noise suppression method using SVD block transform. 5,010,504, Cl. 364-574.000.
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Lee, James C., to Honeywell Inc. Method for applying optical interference coating. 5,009,920, Cl. 427-9.000.
Lee, Philip H. J.: *See*—
Grandjean, Pierre-Andre; and Lee, Philip H. J., 5,009,229, Cl. 128-419.00P.
Lee, Richard: *See*—
Bailey, Thomas F.; Lancaster, Charles E.; and Lee, Richard, 5,009,265, Cl. 166-118.000.
Lee, Robert D.: *See*—
Dias, Donald R.; Lee, Robert D.; Bolan, Michael L.; and Scherpenberg, Francis A., 5,010,331, Cl. 340-825.310.
Lee, Ta J., to Merck & Co., Inc. Antihypercholesterolemic compounds. 5,010,105, Cl. 514-510.000.
Lee, Vincent K. W. Improved kaleidoscope structure. 5,009,471, Cl. 350-4.100.
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Arditty, Herve ; and Lefevre, Hevre , 5,009,504, Cl. 356-350.000.
LeFreniere, Robert C.: *See*—
Wiant, Matthew J.; Lynch, William R.; and LeFreniere, Robert C., 5,009,917, Cl. 426-631.000.
Lehmann, Karl-Heinz: *See*—
Palm, Gangolf; Lehmann, Karl-Heinz; and Heinemann, Hans-Joachim, 5,008,979, Cl. 19-97.000.
Lehmann, Volker: *See*—
Foell, Helmut; and Lehmann, Volker, 5,010,294, Cl. 324-158.00D.
Lehto, Jorma, to Oy Tampella AB. Method of and an arrangement for gluing a web to a core in a reeling device. 5,009,736, Cl. 156-250.000.
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Leland Stanford Junior University, Board of Trustees of the: *See*—
Zare, Richard N.; Huang, Xiaohua; and Ohms, Jack I., 5,009,760, Cl. 204-183.300.
Lemoyne, Remi: *See*—
Clairouin, Noel; Gueroult, Alain; and Lemoyne, Remi, 5,009,918, Cl. 426-643.000.
Leonard, David W., Sr.: *See*—
Hilbish, Brian K.; Leonard, David W., Sr.; Burgess, Arnold C.; and Burns, David R., 5,009,550, Cl. 406-87.000.
Leonard, Donald A.; and Sweeney, Harold E., to GTE Government Systems Corporation. Remote method of measuring subsurface water temperatures. 5,009,500, Cl. 356-43.000.
Leonard, Thomas A.: *See*—
Murphy, Martin J., Jr.; Stubbs, Jack B.; and Leonard, Thomas A., 5,009,503, Cl. 356-339.000.
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Lepinoy, Dominique, 5,009,318, Cl. 206-524.800.
LePisto, Matti; Ilmanen, Reijo; Karlsson, Markku; and Laakso, Sauli, to Valmet Oy. Method for on-machine coating-drying of a paper web or the like. 5,009,016, Cl. 34-41.000.
Lepow, Joyce. Sheet for foam sofa bed. 5,008,966, Cl. 5-496.000.
Lescaut, Pierre L., to Atochem. Method of joining pipes at their ends to form a pipeline. 5,009,737, Cl. 156-264.000.
Lesher, George Y., deceased (by Lesher, Louise E., executrix); Bacon, Edward R.; Singh, Baldev; and Kuo, Gee-Hong, to Sterling Drug Inc. Imidazopyridines, compositions and use. 5,010,086, Cl. 514-303.000.
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Lessi, Jacques; Perreau, Philippe; Bary, Daniel; and Grard, Guy, to Institute Francais du Petrole. Device and method for measuring the deformations of a sample. 5,009,512, Cl. 374-6.000.
Leung, Peter K.; Steiger, Ronald P.; and Kunze, Kenneth R., to Exxon Production Research Company. Method for determining the swelling clay content of cement mixtures by dielectric measurements. 5,010,301, Cl. 324-376.000.
Lever Brothers Company, Division of Conopco Inc.: *See*—
Foster, Francis G., 5,009,800, Cl. 252-8.900.
Levi, Mark W., to United States of America, America. Wafer cleaning method. 5,009,240, Cl. 134-7.000.
Levine, Harry; Slade, Louise; Van Lengerich, Bernhard; and Pickup, John G., to Nabisco Brands, Inc. Glassy matrices containing volatile and/or labile components, and processes for preparation and use thereof. 5,009,900, Cl. 426-96.000.
Levinson, Arthur; Simonsen, Christian; and Yelverton, Elizabeth M., to Genentech, Inc. Human t-PA production using vectors coding DHFR protein. 5,010,002, Cl. 435-69.200.
Levison, Barrie. Towel or cloth container. 5,009,327, Cl. 220-890.000.
Levy, Davida. Magnetic jewelry closure with clip. 5,008,984, Cl. 24-303.000.
Lewis, Larry N., to General Electric Company. Flame retardant aromatic polycarbonate compositions. 5,010,148, Cl. 525-464.000.
Leybold Aktiengesellschaft: *See*—
Gruenwald, Heinrich; Ramisch, Hans; and Pawlakowitsch, Anton, 5,009,738, Cl. 156-345.000.
Liang, Jeanine: *See*—
Lee, Hsien-Che; Lee, Hui-Jung; Kwon, Heemin; and Liang, Jeanine, 5,010,504, Cl. 364-574.000.
Liang, Rong-Chang; Colyer, Emerson K.; Chen, Jing-Den; Kintz, Karl A.; and Suen, Chih-Her, to Mead Corporation, The. Microsuspension polymerization. 5,010,114, Cl. 521-109.100.
Liaw, Peter. Structure of a multipurpose, hand-held swivel type stationery case. 5,009,336, Cl. 211-69.100.
Libbey-Owens-Ford Co.: *See*—
Weaver, William R., 5,009,821, Cl. 264-22.000.
Liberty Diversified Industries, Inc.: *See*—
Esau, LaVerne, 5,009,565, Cl. 414-607.000.
Liesen, Gregory P.: *See*—
Lam, William Y.; and Liesen, Gregory P., 5,009,802, Cl. 252-48.200.
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Liet, Fredericus, 5,009,219, Cl. 126-523.000.
Light Ideas Incorporated: *See*—
Streck, Donald A.; and Iggulden, Jerry R., 5,009,368, Cl. 239-70.000.
Lilliwyte Societe Anonyme: *See*—
Baker, Derrick J.; Bugden, Walter G.; and Smith, Peter R., 5,009,357, Cl. 228-122.000.
Lin, Emily M. Y. Double hook-bolt unit lock. 5,009,089, Cl. 70-114.000.
Lin, Israel J.; and Yotvat, Jacob. Magnetic treatment of water used for agricultural purposes. 5,009,791, Cl. 210-695.000.
Lin, Jiang-Jen: *See*—
Speranza, George P.; Lin, Jiang-Jen; and Cuscurida, Michael, 5,010,160, Cl. 528-45.000.
Lin, John Y. Waterscape lamp with shade of proximity-capacitance-sensing type device. 5,010,460, Cl. 362-101.000.
Lin, Sung-Wei: *See*—
Gill, Manzur; and Lin, Sung-Wei, 5,010,028, Cl. 437-43.000.
Lin, True-Lon; Fathauer, Robert W.; and Grunthaner, Paula J., to California Institute of Technology. Pinhole-free growth of epitaxial $CoSi_2$ film on Si(111). 5,010,037, Cl. 437-200.000.
Lincoln, Thomas C., to Microdot Inc. Method and apparatus for fabricating a pigtailed lens assembly. 5,009,482, Cl. 350-96.180.
Lindel, Hans; Hallenbach, Werner; Berschauer, Friedrich; Greife, Heinrich; and Klotz, Gernot, to Bayer Aktiengesellschaft. 2,4-dihalogeno-6-pyridylethanolphenylisopropylamines for shifting the protein-fat ratio of animals in favor of protein. 5,010,091, Cl. 514-357.000.
Linder, Ernst: *See*—
Grob, Ferdinand; Kienzler, Dieter; Linder, Ernst; Potschin, Roger; and Stutzenberger, Heinz, 5,009,064, Cl. 60-276.000.
Lindner, Christian: *See*—
Westeppe, Uwe; Piejko, Karl-Erwin; and Lindner, Christian, 5,010,138, Cl. 525-183.000.
Lindsay, William B., to General Signal Corporation. Ball screw supported Z stage. 5,010,295, Cl. 324-158.00R.
Lindstrom, Michael J., to Atochem North America, Inc. Method for determining sulfur loading in organic polysulfides. 5,010,022, Cl. 436-123.000.
Linke, Udo: *See*—
Boden, Karl; Ibach, Harald; and Linke, Udo, 5,009,865, Cl. 422-249.000.
Linsmeyer, Greg: *See*—
Linsmeyer, John C.; and Linsmeyer, Greg, 5,009,378, Cl. 248-99.000.
Linsmeyer, John C.; and Linsmeyer, Greg. Rake mate and methods of constructing and utilizing same. 5,009,378, Cl. 248-99.000.
Linssen, Johannes L. J. M.; and Pleyers, Jozef J. A., to Oce Nederland B.V. Apparatus for supplying and discharging originals in a copying machine. 5,010,373, Cl. 355-319.000.
Linville, Andrew F., Jr.; and Shirley, Thomas E., to Mobil Oil Corporation. Method of digital filtering. 5,010,526, Cl. 367-46.000.
Lipkin, Charles L.; and Jones, Marianne, to Andrew Corporation. Anti-icing and de-icing system for reflector-type microwave antennas. 5,010,350, Cl. 343-704.000.
Lipman, Kenneth; and Young, Douglas G., to International Fuel Cells. Current balancing structure for semiconductor switching devices. 5,010,470, Cl. 363-132.000.
Lipo, Thomas A.; and Xu, Longya, to Wisconsin Alumni Research Foundation. Variable speed machine with high power density. 5,010,267, Cl. 310-162.000.
Liposome Company, Inc., The: *See*—
Popescu, Mircea C.; and Mertz, Edgar T., 5,009,819, Cl. 264-4.100.
Lippman, Andrew B.: *See*—
Schreiber, William F.; Lippman, Andrew B.; Adelson, Edward H.; and Netravali, Aran N., 5,010,405, Cl. 358-141.000.

Lipukhin, Jury V.; Danilov, Leonid I.; Ivoditov, Albert N.; Garber, Eduard A.; Subbotin, Anatoly N.; Pavlov, Valentin P.; Zhukov, Jury K.; and Pimenov, Alexandr F. Apparatus for descaling the surface of a strip. 5,009,037, Cl. 51-7.000.

Littleton, L. Arthur: *See*—
Freidel, Kenneth; Littleton, L. Arthur; and Freund, William G., 5,009,693, Cl. 65-107.000.

Litz, Lawrence M.: *See*—
Weise, Mark K.; Kingsley, Jeffery P.; and Litz, Lawrence M., 5,009,816, Cl. 261-21.000.

Liu, Yow-Juang (Bill); and Hadjizadeh-Amini, Zahra, to Advanced Micro Devices, Inc. Method of detecting the width of spacers and lightly doped drain regions. 5,010,029, Cl. 437-44.000.

Ljungstrom, Tommy: *See*—
Hanerus, Goran; and Ljungstrom, Tommy, 5,009,339, Cl. 222-1.000.

Lloyd, Kenneth: *See*—
Albino, Anthony; Lloyd, Kenneth; Ikeda, Hisami; and Old, Lloyd, 5,009,995, Cl. 435-7.230.

Lo Baido, Giuseppe: *See*—
Antonaroli, Simonetta; Bianco, Armandodariano; Brufani, Mario; Lo Baido, Giuseppe; and Rende, Giorgio, 5,010,204, Cl. 548-128.000.

Lobitz, Walter A.: *See*—
Chang, Ker-Chin; Elkins, Clarence E.; Marshall, Paul A.; Dunwoodie, Duane E.; Mansour, Mohamed M.; Bauer, Paul R.; and Lobitz, Walter A., 5,010,544, Cl. 370-13.100.

Loeffelholz, Frido: *See*—
Worschech, Kurt; Wedl, Peter; Fleischer, Erwin; Loeffelholz, Frido; and Jaeckel, Manfred, 5,010,123, Cl. 524-114.000.

Loewe, Erhard, to Du Pont de Nemours, E. I., and Company. Roll cassette with spacers for height adjustment. 5,009,372, Cl. 242-71.100.

Lof, Stig U., to Uniroc Aktiebolag. Laterally adjustable drilling tool. 5,009,274, Cl. 175-260.000.

Loge, Olaf: *See*—
Skuballa, Werner; Dahl, Helmut; Vorbrueggen, Helmut; Loge, Olaf; and Thierauch, Karl-Heinz, 5,010,065, Cl. 514-58.000.

Lombardino, Paul A.; Saxon, Ronald L.; and Supchak, Dennis W., to Pharmacia Diagnostics Inc. Reagent tablet dispenser. 5,009,561, Cl. 414-412.000.

Lonardi, Emile, to Paul Wrth S.A. Device for reducing the stresses on a sealing shutter. 5,009,398, Cl. 266-199.000.

Loncraine Broxton & Partners Limited: *See*—
Broxton, Peter A., 5,009,341, Cl. 222-130.000.

Long, Royal B. Lock device with retaining cable. 5,009,087, Cl. 70-49.000.

Longley, Ross E.: *See*—
Gunasekera, Malika; Gunasekera, Sarath P.; Longley, Ross E.; and Burres, Neal S., 5,010,099, Cl. 514-459.000.

Longuet-Higgins, Michael S. Building blocks. 5,009,625, Cl. 446-92.000.

Lonza LTD: *See*—
Kunz, Reiner; and Dietrich, Rainer, 5,009,675, Cl. 51-295.000.

Loos, Horst: *See*—
Schneider, Alfred; Loos, Horst; and Fischbach, Karl H., 5,009,034, Cl. 49-192.000.

Lord, Peter R., to North Carolina State University. Method and apparatus for detecting mechanical roll imperfections in a roler drafting system. 5,010,494, Cl. 364-507.000.

Lord, Randall D.: *See*—
Eilert, Randall N.; Neel, Robert M.; Harvey, N. Thatcher; Ames, Wilbur R., IV; and Lord, Randall D., 5,008,974, Cl. 16-114.00R.

L'Oreal: *See*—
Grollier, Jean-Francois; Fiquet, Claire; Fourcadier, Chantal; Dubief, Claude; and Cauwet, Daniele, 5,009,880, Cl. 424-047.000.
Gueret, Jean-Louis, 5,009,534, Cl. 401-75.000.
Morane, Bruno, 5,009,340, Cl. 222-94.000.

Lorenzana, Moises B.; and Lorenzana, Vance A. Apparatus for supplying water continuously to tree stand. 5,009,028, Cl. 47-40.500.

Lorenzana, Vance A.: *See*—
Lorenzana, Moises B.; and Lorenzana, Vance A., 5,009,028, Cl. 47-40.500.

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Kronfli, Esam; Lovell, Keith V.; Hooper, Alan; and Neat, Robin J., 5,009,970, Cl. 429-192.000.

Low, John A.: *See*—
Chance, Lynn C.; and Low, John A., 5,009,307, Cl. 198-538.000.

Loy, Jerald M.: *See*—
Dunaway, Thomas J.; Spielberger, Richard K.; Dicks, Lori A.; and Loy, Jerald M., 5,010,387, Cl. 357-70.000.

LPF Verpakkingen B.V.: *See*—
Huizinga, Gert J., 5,010,231, Cl. 219-121.690.

Luallin, John M.; Nagengast, William E.; and Roeske, Robert G., to General Motors Corporation. Headlamp assembly. 5,010,455, Cl. 362-61.000.

Lucas Industries, plc: *See*—
Shirey, Roy D.; Nelson, Michael T.; and Laurenzi, Robert J., 5,010,224, Cl. 219-69.170.

Lucas, Robert M.: *See*—
Hoffman, Chalres T., Jr.; Gordon, Ralph A.; Hosmer, Thomas P.; and Lucas, Robert M., 5,009,292, Cl. 188-71.700.

Luddy, Michael A. G.: *See*—
Chow, Allan T.; and Luddy, Michael A. G., 5,009,998, Cl. 435-7.920.

Ludwig, James E. Arrow rest and holder apparatus. 5,009,215, Cl. 124-44.500.

Lueschen, Jeffrey D. Surfing saucer. 5,009,623, Cl. 441-56.000.

Lui, Chung Y., to Merck & Co., Inc. Sustained release with high and low viscosity HPMC. 5,009,895, Cl. 424-465.000.

Luksas, Anthony J.: *See*—
Ahmed, Salah H.; and Luksas, Anthony J., 5,009,913, Cl. 426-581.000.

Lurie, Mark. Production of extruded round rod. 5,009,825, Cl. 264-148.000.

Lutz, David E.; and Lutz, David W. Cargo carrying vehicle having a movable bulkhead located therein. 5,009,564, Cl. 414-510.000.

Lutz, David W.: *See*—
Lutz, David E.; and Lutz, David W., 5,009,564, Cl. 414-510.000.

Lutzke, Wayne, to Nigrelli Systems, Inc. Automatic case accumulator. 5,009,303, Cl. 198-347.300.

Luyckx, Marcel G. M.: *See*—
Stokbroekx, Raymond A.; Luyckx, Marcel G. M.; and Janssens, Frans E., 5,010,198, Cl. 546-114.000.

Luzio, Gary A.: *See*—
Cohen, Richmond R.; and Luzio, Gary A., 5,009,239, Cl. 131-342.000.

Lyle, Robert L., Jr., to North American Philips Corporation. Voltage regulator with reduced semiconductor power dissipation. 5,010,292, Cl. 323-274.000.

Lynch, William R.: *See*—
Wiant, Matthew J.; Lynch, William R.; and LeFreniere, Robert C., 5,009,917, Cl. 426-631.000.

Lynn, Gordon E.: *See*—
Gatchel, Gary; Newgarden, Joseph E.; and Lynn, Gordon E., 5,009,421, Cl. 273-30.000.

Lyon, Richard S.: *See*—
Sarko, Leonard S.; and Lyon, Richard S., 5,009,511, Cl. 366-348.000.

Lysenkov, Viktor I.: *See*—
Fedin, Marat A.; Kuznetsova, Tatyana A.; Lysenkov, Viktor I.; Novikova, Svetlana A.; Savchuk, Valentin A.; Sedelnikov, Anatoly I.; Shabunya, Vera P.; Udarov, Boris G.; Tikhonova, Tatyana S.; Polyakova, Nina P.; and Paklin, Sergei I., 5,010,106, Cl. 514-546.000.

Lyzinski, David: *See*—
Clark, Frederick T.; Hensley, Albert L., Jr.; Lyzinski, David; and Peck, Lawrence B., 5,009,771, Cl. 208-216.0PP.

M.C.R. Farmer, Inc.: *See*—
Mintzer, Joseph H., 5,010,462, Cl. 362-109.000.

M.E.P. Macchine Elettroniche Piegatrici S.p.A.: *See*—
Del Fabro, Marcello; and Del Fabro, Giorgio, 5,009,097, Cl. 72-387.000.

M&FC Holding Company, Inc.: *See*—
Esola, John L.; and Kessler, David L., 5,009,245, Cl. 137-116.500.

Mabuchi, Kazuichi: *See*—
Yamada, Shinjiro; Satoh, Seiki; Mabuchi, Kazuichi; Kitao, Shiei; and Egawa, Yoshiaki, 5,010,264, Cl. 310-72.000.

Mabuchi Motor Co., Ltd.: *See*—
Yamada, Shinjiro; Satoh, Seiki; Mabuchi, Kazuichi; Kitao, Shiei; and Egawa, Yoshiaki, 5,010,264, Cl. 310-72.000.

MacDonald, Michael: *See*—
Gerke, David B.; and MacDonald, Michael, 5,009,384, Cl. 248-343.000.

Macfarlane, Donald E. Process for purifying DNA and RNA using cationic detergents. 5,010,183, Cl. 536-27.000.

MacFarlane, Glen R., to General Motors Corporation. Intake reservoir for an engine having a check valve. 5,009,199, Cl. 123-52.0MF.

Machida, Satoshi; and Hattori, Akio, to Kubota Ltd. Speed control structure. 5,009,125, Cl. 74-606.00R.

Machida, Yoshimasa: *See*—
Yamauchi, Hiroshi; Sugiyama, Isao; Saito, Isao; Nomoto, Seiichiro; Kamiya, Takashi; Machida, Yoshimasa; and Negi, Shigeto, 5,010,188, Cl. 540-222.000.

Machinefabriek Wila B.V.: *See*—
van Merksteijn, Jacobus L., 5,009,098, Cl. 72-389.000.

Mackenzie, Harold B., to New Life Foundation. Municipal solid waste material sorting trommel system. 5,009,370, Cl. 241-24.000.

MacLeod, Richard J.; Chubb, Norman L.; and Schiedegger, Charles E., to Tapco Products Company, Inc. Roof vent. 5,009,149, Cl. 98-42.210.

Macome Corporation: *See*—
Uemura, Saburo, 5,010,298, Cl. 324-207.190.

MacPherson plc: *See*—
Waddington, Keith J.; and Johnson, Peter W., 5,009,935, Cl. 428-457.000.

Madey, John M. J.; Benson, Stephen V.; Schultz, John F.; and Cutolo, Antonello. Non-linear intractivity optical devices for free electron lasers. 5,010,555, Cl. 372-2.000.

Maeda, Chikatoshi: *See*—
Sugimoto, Atsushi; Nakano, Osamu; Yasuda, Shigeru; Maeda, Chikatoshi; Ozone, Toshio; and Kawagoe, Makoto, 5,009,843, Cl. 420-112.000.

Maeda Industries, Ltd.: *See*—
Tagawa, Koichi, 5,009,629, Cl. 474-80.000.

Maeda, Miho: *See*—
Kamishioiri, Nobuyuki; Kaneda, Manabu; Tanaami, Toshiyasu; and Maeda, Miho, 5,009,651, Cl. 604-378.000.

Maeda, Minoru: *See*—
Nakagawa, Hiroshi; and Maeda, Minoru, 5,010,262, Cl. 310-12.000.

Maeda, Mitsuo: *See*—
Ueyama, Satoshi; Kawakubo, Hiroaki; Isoda, Satoru; and Maeda, Mitsuo, 5,010,451, Cl. 361-504.000.

Maeda, Shigemi: *See*—
Fuji, Hiroshi; Fujiwara, Tsuneo; Iwaki, Takashi; Numata, Tomiyuki; Tsuji, Kentaroh; Maeda, Shigemi; Yamaguchi, Takeshi; Kojima, Kunio; Deguchi, Toshihisa; and Terashima, Shigeo, 5,010,540, Cl. 369-50.000.

Maekawa, Yoshikazu; and Hirata, Tetsuo, to Konica Corporation. Copier with automatic document feed having jam prevention function. 5,010,364, Cl. 355-207.000.

Maeno, Matagoro: *See*—
Ohmi, Tadahiro; Miki, Masahiro; Kikuyama, Hirohisa; and Maeno, Matagoro, 5,009,963, Cl. 428-472.200.

Maeno, Satoru: *See*—
Kasahara, Nobuo; Watanuki, Masayoshi; Maeno, Satoru; and Ohkuni, Masato, 5,010,372, Cl. 355-313.000.

Maeno, Yoshinori; Kobayashi, Masanobu; and Oishi, Kayoko, to Oki Electric Industry Co., Ltd. Magneto-optical recording medium having protective film with increased kerr effect and improved protection characteristic and manufacturing method of the same. 5,009,762, Cl. 204-192.160.

Maenpaa, Matti; Lehtoluoma, Teuvo; Henttinen, Kauko; Jokipalo, Pertti; Saren, Aimo; and Pirinen, Seppo, to Rautaruukki Oy. Method and apparatus for the replacing of working rolls in a rolling mill. 5,009,096, Cl. 72-239.000.

Mag-Tek, Inc.: *See*—
Sheldon, Dunstan P., 5,010,240, Cl. 235-382.000.

Magley, Donald A.: *See*—
Bustamante, Michael R.; Renaker, John J., Jr.; and Magley, Donald A., 5,009,790, Cl. 210-689.000.

Maher, Galeb H., to MRA Laboratories, Inc. Capacitor with fine grained $BaTiO_3$ body and method for making. 5,010,443, Cl. 361-321.000.

Maholick, Andrew W.: *See*—
Kippenhan, B. William; and Maholick, Andrew W., 5,010,514, Cl. 364-900.000.

Mahrer, Kenneth D., to Gas Research Institute. Method for determining the depth of a hydraulic fracture zone in the earth. 5,010,527, Cl. 367-86.000.

Maier, Ludwig: *See*—
Wenski, Guido; Maier, Ludwig; and Kreuzer, Franz-Heinrich, 5,009,934, Cl. 427-387.000.

Maier, Ulrich: *See*—
Seidel, Willi; Ehniss, Roland; Skabrond, Klaus; Sauter, Ulrich; Maier, Ulrich; and Ebner, Roland, 5,009,128, Cl. 74-866.000.

Maitani, Yoshihisa, to Olympus Optical Company Ltd. Method and apparatus for photometry from plural points of automatic exposure camera. 5,010,359, Cl. 354-410.000.

Makita, Kensuke: *See*—
Matsuda, Naohiko; and Makita, Kensuke, 5,009,933, Cl. 427-287.000.

Makkuni, Ranjit; Zdybel, Frank, Jr.; and Stults, Robert A., to Xerox Corporation. Gesture-modified diagram for retrieval of image resembling diagram, with parts selectable for further interactive retrieval. 5,010,500, Cl. 364-521.000.

Malherbe, Bent, to Sony Corporation. Method of making surface finishing rollers as well as a roller made thereby. 5,008,993, Cl. 29-125.000.

Malvern, Alan R., to British Aerospace Public Limited Company. Optical sensor for determining changes in a dimension and/or a temperature of an object. 5,009,505, Cl. 356-352.000.

MAN Nutzfahrzeuge Aktiengesellschaft: *See*—
Deschler, Gerhard, 5,009,001, Cl. 29-888.080.

MAN Roland Druckmaschinen AG: *See*—
John, Thomas; and Bock, Georg, 5,009,158, Cl. 101-219.000.

Manabe, Hajime; and Murata, Yoshiyuki, to Casio Computer Co., Ltd. Electronic percussion instrument having a memory function and a musical tone parameter control function. 5,009,146, Cl. 84-615.000.

Manabe, Haruhiko: *See*—
Suzuki, Fumio; Kuroda, Takeshi; Nakasato, Yoshisuke; Ohmori, Kenji; and Manabe, Haruhiko, 5,010,084, Cl. 514-293.000.

Mandai, Harufumi; Tanaka, Yukio; Takakura, Shinichi; and Nakagawa, Takuji, to Murata Manufacturing Co., Ltd. Method of manufacturing laminated ceramic electronic component. 5,009,744, Cl. 156-656.000.

Manderfeld, Donald J.; and Sells, Robert A., to DataCard Corporation. Input hopper apparatus. 5,009,411, Cl. 271-129.000.

Manfredi, Antonina: *See*—
Manfredi, Carl; Manfredi, Antonina; Manfredi, Dario P.; and Giarraffa, Savia, 5,009,374, Cl. 244-1.00R.

Manfredi, Carl; Manfredi, Antonina; Manfredi, Dario P.; and Giarraffa, Savia. Aircraft with releasable wings. 5,009,374, Cl. 244-1.00R.

Manfredi, Dario P.: *See*—
Manfredi, Carl; Manfredi, Antonina; Manfredi, Dario P.; and Giarraffa, Savia, 5,009,374, Cl. 244-1.00R.

Manganaro, James L.: *See*—
Wolf, Steven D.; Manganaro, James L.; and Miller, Ronald H., 5,009,677, Cl. 55-12.000.

Mangeruga, Joseph N. Debris collection for a lawnmower. 5,009,377, Cl. 248-99.000.

Maninger, Loren L.; and Marks, Bruce G., to RCA Licensing Corporation. Color picture tube having an electron gun with reduced convergence drift. 5,010,271, Cl. 313-412.000.

Mannesmann Aktiengesellschaft: *See*—
Gugel, Bernd; Kaufmann, Clemens; Kitzberger, Herbert; and Rohrer, Kurt, 5,009,529, Cl. 400-124.000.

Manoliu, Juliana, to National Semiconductor Corporation. CMOS and bipolar fabrication process using selective epitaxial growth scalable to below 0.5 micron. 5,010,034, Cl. 437-89.000.

Manoury, Philippe; Binet, Jean; Obitz, Daniel; Defosse, Gerard; Dewitte, Elisabeth; and Veronique, Corinne, to Synthelabo. Indolone derivatives, their preparation and their application in therapy. 5,010,079, Cl. 514-253.000.

Manschitz, Erwin, to Hilti Aktiengesellschaft. Tool chuck for tool bits. 5,009,440, Cl. 279-71.000.

Mansour, Mohamed M.: *See*—
Chang, Ker-Chin; Elkins, Clarence E.; Marshall, Paul A.; Dunwoodie, Duane E.; Mansour, Mohamed M.; Bauer, Paul R.; and Lobitz, Walter A., 5,010,544, Cl. 370-13.100.

Manssen, Keith R.; and Moutrie, Michael F., to Motorola, Inc. Ceramic block filter with co-fired coupling pins. 5,010,309, Cl. 333-206.000.

Mansukhani, Gul: *See*—
Cherukuri, Subraman R.; Raman, Krishna; Mansukhani, Gul; Cifrese, Ralph; and Wong, Lucy L., 5,009,893, Cl. 424-440.000.

Manufacture d'Appareillage Electrique de Cahors: *See*—
Therond, Michel, 5,009,734, Cl. 156-184.000.

Manufacturer's Consultants, Inc.: *See*—
Smith, Franklin G., 5,009,256, Cl. 152-221.000.

Manville Corporation: *See*—
Smith, Timothy R., 5,009,906, Cl. 426-330.400.

Marc, Pierre A.: *See*—
Brady, Thomas E.; Condon, Michael E.; and Marc, Pierre A., 5,009,699, Cl. 71-92.000.

Marciano-Agostinelli, Fabrizio; Barbaro-Forleo, Marco; Marin, Carlo; and Cinquemani, Paul L., to Pirelli Cable Corp. Power cable with water swellable agents and elongated metal elements outside cable insulation. 5,010,209, Cl. 174-23.00C.

Marconi Instruments, Inc.: *See*—
Janney, Mark A.; Newey, Roger; and Robinson, Irwin J., III, 5,010,560, Cl. 377-20.000.

Maresch, Gerald: *See*—
Hula, Emil; and Maresch, Gerald, 5,009,750, Cl. 204-13.000.

Maresch, Peter: *See*—
Glomb, Reiner; Maresch, Peter; and Wagner, Ralf, 5,009,136, Cl. 82-127.000.

Marhold, Albrecht: *See*—
Schade, Gerold; Marhold, Albrecht; and Brandes, Wilhelm, 5,010,094, Cl. 514-399.000.

Maric, Milan; and Kulas, John I. Drill assembly. 5,009,271, Cl. 175-53.000.

Marin, Carlo: *See*—
Marciano-Agostinelli, Fabrizio; Barbaro-Forleo, Marco; Marin, Carlo; and Cinquemani, Paul L., 5,010,209, Cl. 174-23.00C.

Marin Tek, Inc.: *See*—
Missimer, Dale J.; Fyfe, David T., Jr.; Housman, Joseph J.; and Forrest, Scott M., 5,009,073, Cl. 62-51.100.

Marine Environmental Research, Inc.: *See*—
Riffe, William J.; and Carter, Jack D., Jr., 5,009,757, Cl. 204-147.000.

Marion Laboratories, Inc.: *See*—
Bottom, Carey B.; and Kwoka, Margaret N., 5,010,069, Cl. 514-166.000.

Markel Industries, Inc.: *See*—
Preston, Wallace, 5,008,968, Cl. 15-1.510.

Marks, Bruce G.: *See*—
Maninger, Loren L.; and Marks, Bruce G., 5,010,271, Cl. 313-412.000.

Markwell, Roger E.; Smith, Stephen A.; Hughes, Ian; and Gaster, Laramie M., to Beecham Pharmaceuticals. Novel compounds. 5,010,097, Cl. 514-419.000.

Maroni, Victor A., to Arch Development Corporation. Method of bonding metals to ceramics. 5,010,053, Cl. 505-1.000.

Marosi, Laszlo: *See*—
Steck, Werner; Marosi, Laszlo; Haberkorn, Herbert; Feser, Rainer; Huebner, Werner; and Jakusch, Helmut, 5,009,877, Cl. 423-607.000.

Marrelli, John C.: *See*—
Rutledge, Gary L., 5,009,517, Cl. 383-72.000.

Mars Incorporated: *See*—
Frontino, Louis J., 5,010,242, Cl. 235-467.000.

Marshall, Paul A.: *See*—
Chang, Ker-Chin; Elkins, Clarence E.; Marshall, Paul A.; Dunwoodie, Duane E.; Mansour, Mohamed M.; Bauer, Paul R.; and Lobitz, Walter A., 5,010,544, Cl. 370-13.100.

Marshall, Rick A. Metal fence post extractor. 5,009,394, Cl. 254-30.000.

Martella, Donald: *See*—
Kalotay, Paul; Bruck, Robert; Emch, Arnold; and Martella, Donald, 5,009,109, Cl. 73-861.380.

Martelli, Joseph M. Batting practice method. 5,009,420, Cl. 273-26.00R.

Marten, F. Lennart: *See*—
Famili, Amir F.; Marten, F. Lennart; and Mohanty, Dillip K., 5,010,153, Cl. 526-243.000.

Martin, Antonio M.; and Scott, Peter J., to Memorial University of Newfoundland. Liquid organic peat fertilizer and process of preparing same. 5,009,697, Cl. 71-24.000.

Martin Automatic, Inc.: *See*—
Cederholm, Roger; and Plude, Christopher J., 5,009,749, Cl. 162-271.000.

Martin Brinkmann AG: *See*—
Schmidt, Ernst; Stehmeier, Heinz; Ruppert, Heinrich W.; Gatschmann, Klaus G.; and Schutze, Gunter, 5,009,237, Cl. 131-70.000.

Martin, Gary D.: *See*—
Bechtel, Linda K.; and Martin, Gary D., 5,010,554, Cl. 371-37.100.

Martin, George R.: *See*—
Fuller, George C.; Martin, George R.; Mueller, Richard A.; and Reich, Reuven, 5,010,080, Cl. 514-255.000.

Martin GmbH fur Umweld-und Energietechnik: *See*—
Martin, Johannes J. E.; and Martin, Walter J., 5,009,171, Cl. 110-109.000.
Martin, Johannes J. E.; and Martin, Walter J., to Martin GmbH fur Umweld-und Energietechnik. Feed device with filling hopper and adjoining feed chute for feeding waste to incineration plants. 5,009,171, Cl. 110-109.000.
Martin, Joseph A.: *See*—
Lambert, Robert W.; Martin, Joseph A.; and Thomas, Gareth J., 5,010,060, Cl. 514-49.000.
Martin, Luther W.; and Smith, Richard L. Window cutter for gas service tie overs. 5,009,007, Cl. 30-92.000.
Martin, Scott D.: *See*—
Butkus, Anthony K.; and Martin, Scott D., 5,010,046, Cl. 501-117.000.
Martin, Theresa E.: *See*—
Bank, Howard M.; Cifuentes, Martin E.; and Martin, Theresa E., 5,010,159, Cl. 528-23.000.
Martin, Walter J.: *See*—
Martin, Johannes J. E.; and Martin, Walter J., 5,009,171, Cl. 110-109.000.
Martinez, David M.; and Campbell, Gordon C., to Robert Bosch Power Tool Corporation. Saber saw. 5,009,012, Cl. 30-394.000.
Martischius, Franz-Dieter; Vogel, Hans-Henning; Greif, Norbert; Oppenlaender, Knut; Denzinger, Walter; and Hartmann, Heinrich, to BASF Aktiengesellschaft. Fuels for gasoline engines. 5,009,670, Cl. 44-385.000.
Maru, Shingo, to Maruyama Mfg. Co., Ltd. Multiple reciprocating pump. 5,009,580, Cl. 417-533.000.
Marutake, Yozo; Fukutome, Tatsuro; and Asami, Motomu, to Rion Kabushiki Kaisha. Audio current pick-up device. 5,010,575, Cl. 381-68.000.
Maruyama, Hiroshi; Kiryu, Naohiko; Minezaki, Etsuko; Tagashira, Susumu; and Shimokawahara, Hisashi, to Somar Corporation. Light-safe masking film. 5,009,944, Cl. 428-40.000.
Maruyama Mfg. Co., Ltd.: *See*—
Maru, Shingo, 5,009,580, Cl. 417-533.000.
Masaki, Shouichi; Fukushima, Akira; Fujimoto, Shusaku; and Nakano, Makoto, to Nippondenso Co., Ltd. Anti-skid control system with a common braking pressure control device for different wheels. 5,010,489, Cl. 364-426.020.
Masasumi, Yana; Hitoshi, Nagato; Kiyoshi, Yamada; Shyoji, Ueno; and Kunihiro, Shibuya, to Tokyo Shibaura Denki Kabushiki Kaisha. Thermal transfer color printer with sheet retaining and guiding structure adjacent platen. 5,009,527, Cl. 400-120.000.
Mascart, Dominique: *See*—
Bonnand, Christian; Mascart, Dominique; and Druelle, Philippe, 5,008,996, Cl. 29-727.000.
Maschelein, Charles: *See*—
Prieels, Jean-Paul; Maschelein, Charles; and Heilporn, Marc, 5,010,007, Cl. 435-190.000.
Maschinenfabrik Andritz Actiengesellschaft: *See*—
Hula, Emil; and Maresch, Gerald, 5,009,750, Cl. 204-13.000.
Maschinenfabrik Rieter AG: *See*—
Waeber, Rene; Knabenhans, Fritz; and Bachmann, Othmar, 5,008,978, Cl. 19-66.0CC.
Mashita, Kentaro: *See*—
Ohmae, Tadayuki; Toyoshima, Yoshiki; Mashita, Kentaro; Yamaguchi, Noboru; and Nambu, Jinsho, 5,010,136, Cl. 525-66.000.
Massachusetts Institute of Technology: *See*—
Glicksman, Leon R.; and Lanciani, Arlene J., 5,010,112, Cl. 521-76.000.
Ron, Eyal; Staubli, Andrea; and Langer, Robert S., 5,010,167, Cl. 528-328.000.
Schreiber, William F.; Lippman, Andrew B.; Adelson, Edward H.; and Netravali, Aran N., 5,010,405, Cl. 358-141.000.
Massey, Dale A., to Harper-Wyman Company. Linear flow turn down valve. 5,009,393, Cl. 251-207.000.
Masuda, Kenji, to Daikin Industries, Ltd. Flowmeter. 5,009,248, Cl. 137-486.000.
Masuda, Sadao: *See*—
Tsuruta, Shigeru; and Masuda, Sadao, 5,010,474, Cl. 364-167.010.
Maternaghan, Trevor J.: *See*—
Mowforth, Clive W.; Bullock, James F.; Maternaghan, Trevor J.; and Harvey, Karen N., 5,009,991, Cl. 430-567.000.
Matijega, Roney J.: *See*—
Herrington, Ronald M.; Turner, Robert B.; and Matijega, Roney J., 5,010,117, Cl. 521-159.000.
Matoushek, Robert J.; Fisher, Terrence L.; and Whritenor, James A., to Eastman Kodak Company. Clamping apparatus for thermal transfer printer. 5,009,509, Cl. 346-138.000.
Matsubara, Shinichi; Uehara, Masafumi; Bunya, Shinichi; and Katahashi, Eriko, to Konica Corporation; and Mitsubishi Kasei Corporation. Photosensitive composition. 5,009,981, Cl. 430-175.000.
Matsuda, Hiroshi: *See*—
Eguchi, Ken; Kawada, Haruki; Sakai, Kunihiro; Tomida, Yoshinori; Matsuda, Hiroshi; Tsuboyama, Akira; Takimoto, Kiyoshi; and Takamatsu, Osamu, 5,009,489, Cl. 350-341.000.
Matsuda, Naohiko; and Makita, Kensuke, to Central Glass Company, Limited. Method and apparatus for coating thin liquid film on plate surface. 5,009,933, Cl. 427-287.000.
Matsuda, Toshiro, to Nissan Motor Company, Limited. Method and system for detecting wheel slippage. 5,009,279, Cl. 180-197.000.
Matsui, Masataka, to Kabushiki Kaisha Toshiba. CMOS static memory. 5,010,521, Cl. 365-189.010.
Matsumoto, Hideo; and Hokuyo, Shigeru, to Mitsubishi Denki Kabushiki Kaisha. Solar cell. 5,009,721, Cl. 136-256.000.
Matsumoto, Hideo: *See*—
Hokuyo, Shigeru; Oda, Takao; and Matsumoto, Hideo, 5,009,720, Cl. 136-255.000.
Matsumoto, Kenji; Yanagita, Tomoatsu; Nishiyama, Yoshinori; Nagai, Masahiko; and Morikuni, Mitsuru, to Hitachi, Ltd.; and Hitachi Computer Engineering Co., Ltd. Load distribution method. 5,010,493, Cl. 364-490.000.
Matsumoto, Makoto: *See*—
Umeda, Itsuki; Takashima, Masaaki; Zama, Yoshiaki; Takemura, Yasuhiko; Funabashi, Yuichi; Watanabe, Junichiro; Takeda, Kiyoshi; and Matsumoto, Makoto, 5,010,137, Cl. 525-104.000.
Matsumoto, Osamu: *See*—
Ohmamyuda, Yukio; Tanabe, Toru; Matsumoto, Osamu; Suzuki, Hidenobu; and Jyouzuka, Masashi, 5,010,457, Cl. 362-66.000.
Matsumoto, Sakae; and Ichikawa, Mitsuo, to Nippon Seiko Kabushiki Kaisha. Telescopic steering column device. 5,009,121, Cl. 74-493.000.
Matsumura, Tetsuya: *See*—
Yoshimoto, Masahiko; and Matsumura, Tetsuya, 5,010,519, Cl. 365-149.000.
Matsuo, Hirokazu; and Nagato, Hiroyasu, to Minolta Camera Kabushiki Kaisha. Copying apparatus provided with automatic document feeder. 5,010,371, Cl. 355-313.000.
Matsuo, Toru: *See*—
Honkura, Yoshinobu; Matsuo, Toru; and Murata, Kouji, 5,009,723, Cl. 148-12.00E.
Matsuo, Yoshiteru: *See*—
Hatomoto, Isamu; and Matsuo, Yoshiteru, 5,009,946, Cl. 428-87.000.
Matsuoka, Hidetoshi: *See*—
Hasegawa, Masahide; Otokawa, Mitsuhiro; Matsuoka, Hidetoshi; and Hirata, Noritsugu, 5,010,424, Cl. 360-77.140.
Matsuoka, Hiroshi: *See*—
Enari, Masahiko; Shikichi, Satoshi; Kawaguchi, Fumiaki; Suzuki, Kenichi; Usui, Masayuki; Matsuoka, Hiroshi; Matsuoka, Kazuhiko; Hosoya, Hideki; Aoki, Akio; and Minoura, Kazuo, 5,010,534, Cl. 369-32.000.
Matsuoka, Hisao: *See*—
Yoshio, Junichi; Hosaka, Sumio; Matsuoka, Hisao; Tsuda, Youichirou; Katagiri, Shoichi; and Nomura, Satoru, 5,010,417, Cl. 358-335.000.
Matsuoka, Kazuhiko: *See*—
Enari, Masahiko; Shikichi, Satoshi; Kawaguchi, Fumiaki; Suzuki, Kenichi; Usui, Masayuki; Matsuoka, Hiroshi; Matsuoka, Kazuhiko; Hosoya, Hideki; Aoki, Akio; and Minoura, Kazuo, 5,010,534, Cl. 369-32.000.
Matsuoka, Noriyuki; and Ishida, Junji, to Yamaichi Electric Mfg. Co., Ltd. Contact shutter device in IC socket. 5,009,609, Cl. 439-73.000.
Matsushita Electric Industrial Co., Ltd.: *See*—
Arakawa, Yoshiki, 5,010,501, Cl. 364-522.000.
Katagawa, Hiromi, 5,010,569, Cl. 379-210.000.
Kawakami, Toshikatsu; Fukuda, Shin; Shinbo, Hiroyasu; Unemura, Toyoaki; Sakamoto, Ken; and Kondo, Tomoji, 5,010,406, Cl. 358-147.000.
Nishino, Masakazu, 5,010,402, Cl. 358-138.000.
Wakita, Katsuya; Sonoda, Nobuo; Shimizu, Tokihiko; Hotta, Shu; and Soga, Mamoru, 5,009,815, Cl. 252-582.000.
Wakita, Naohide; Uemura, Tsuyoshi; Ohnishi, Hiroyuki; Ohba, Noriko; Ota, Isao; and Fujita, Shingo, 5,010,327, Cl. 340-784.000.
Yamashita, Akio; Yoshimura, Susumu; and Tsuchiya, Sohji, 5,009,958, Cl. 428-411.100.
Yamauchi, Hiroyuki, 5,010,523, Cl. 365-205.000.
Matsushita Electric Works, Ltd.: *See*—
Mukai, Tadayoshi; and Yoshino, Akira, 5,010,287, Cl. 318-801.000.
Matsushita, Nobutaka; Okazaki, Hiroshi; Yamanouchi, Shosuke; Osawa, Yoshitaka; and Tsujigaito, Isao, to Sumitomo Electric Industries Ltd. Fluorine resin coated article. 5,009,959, Cl. 428-419.000.
Matsushita, Takao: *See*—
Ametani, Minoru; Funakoshi, Keigo; Kira, Akihiko; Matsushita, Takao; and Shirakura, Keizo, 5,009,735, Cl. 156-241.000.
Matsuzawa, Jun: *See*—
Tanaka, Kazuyuki; Iwami, Etsuji; Matsuzawa, Jun; Mukoyama, Yoshiyuki; Shibata, Noriohiko; Hanawa, Akinori; and Yokota, Mitsuo, 5,009,949, Cl. 428-260.000.
Matteucci, Mark D.: *See*—
Chang, Chung N.; Hitzeman, Ronald A.; and Matteucci, Mark D., 5,010,003, Cl. 435-69.900.
Matzawrakos, Panajiotis: *See*—
Glockler, Gerhard; Muller, Heinz; Kepplinger, Leopold W.; Matzawrakos, Panajiotis; Koch, Erwin; and Auberger, Heinrich, 5,009,397, Cl. 266-197.000.
Maurer, Fritz; Lantzsch, Reinhard; Fiege, Helmut; and Schnatterer, Albert, to Bayer Aktiengesellschaft. Preparation of phosphoric acid derivatives and intermediates. 5,010,193, Cl. 544-243.000.
Mauro, David J.; Furcsik, Susan L.; Katz, Frances R.; Faron, Eugene J., II; Gottneid, David J.; and Pustek, Frank J., to American Maize-Products Company. Foodstuff containing aewx starch. 5,009,911, Cl. 426-578.000.
Maus, Roy: *See*—
Gersten, Martin; Tibbling, Lars; and Maus, Roy, 5,009,498, Cl. 351-212.000.
Max Co., Ltd.: *See*—
Akizawa, Nobuyuki; Kudo, Yasunori; Kanai, Toshiyuki; Kamei, Yasuo; Oyama, Nobuaki; and Negishi, Akihito, 5,009,355, Cl. 227-114.000.

May, James B.: *See—*
Arvidson, Arvid N.; Dosaj, Vishu D.; and May, James B., 5,009,703, Cl. 75-10.360.
Maya, Leon, to United States of America, Energy. Low-loss binder for hot pressing boron nitride. 5,010,045, Cl. 501-96.000.
Mayer, Carl W.: *See—*
Finter, Jurgen; Hilti, Bruno; Mayer, Carl W.; Minder, Ernst; and Pfeifer, Josef, 5,009,812, Cl. 252-500.000.
Maynus, Kenneth A. Underwater transmitter apparatus. 5,010,529, Cl. 367-137.000.
Maytag Corporation: *See—*
Richardson, Curtis G., 5,009,570, Cl. 415-174.200.
Mayurnik, George: *See—*
Kelley, Joseph M.; Kucher, Donald C.; and Mayurnik, George, 5,009,875, Cl. 423-477.000.
Mazda Motor Corporation: *See—*
Abe, Ryoji; Okita, Junichi; Miyagoshi, Katsunobu; and Hashiyama, Kouichi, 5,009,205, Cl. 123-195.00H.
Edahiro, Takeshi; and Kanai, Seita, 5,009,449, Cl. 280-690.000.
Kijima, Takao; Edahiro, Takeshi; Koyama, Toshihide; and Taniguchi, Haruyuki, 5,009,448, Cl. 280-673.000.
Naito, Yasuo; Kouzuki, Hiroyuki; and Murai, Takeshi, 5,010,490, Cl. 364-426.040.
Yamane, Takakazu; Tanimoto, Yoshio; and Nakahama, Tadamitsu, 5,009,931, Cl. 427-195.000.
Mazda Motor Manufacturing (USA) Corp.: *See—*
Okada, Kenji; and Ueno, Hiroshi, 5,009,758, Cl. 204-180.800.
McAuliffe, Lawrence, Jr.; and Hardy, Sidney D., to Coltec Industries Inc. Electromagnet and reed-type valve assembly. 5,009,390, Cl. 251-129.200.
McCord Winn Textron Inc.: *See—*
Bishai, Macram N., 5,009,212, Cl. 123-533.000.
McCoy, David C. Adjustable armrest for chair. 5,009,467, Cl. 297-411.000.
McCoy, Fred. Gun safety assembly. 5,009,022, Cl. 42-094.000.
McCray, Leonard A. Ground cover sheet. 5,009,033, Cl. 47-80.000.
McCree, John O., to Dow Chemical Company, The. Method of forming a reclosable container with grip strip. 5,009,828, Cl. 264-177.100.
McDaniel, Max P., to Phillips Petroleum Company. Polymerization process utilizing chromium on an acid agglomerated refractory gel. 5,010,152, Cl. 526-106.000.
McDermott, Gregory J. Vehicle door removal apparatus. 5,009,406, Cl. 269-17.000.
McDonald, Edward; Salmon, Roger; Whittle, Alan J.; and Hutchings, Michael G., to Imperial Chemical Industries PLC. Pyrimidine derivatives. 5,010,200, Cl. 546-245.000.
McDonald, Ray S., to Medtronic, Inc. Needle placement verifier. 5,009,644, Cl. 604-175.000.
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Tsuji, Tsuyoshi; Satoh, Masaaki; and Yunoki, Masayuki, 5,009,775, Cl. 210-85.000.
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Fenner, David F.; and Menown, John S., 5,009,501, Cl. 356-152.000.
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Wanger, Mark E.; Methlie, Jennifer L.; Christie, Leslie G.; Dauner, Daniel R.; Domel, Douglas R.; Jones, David P.; Oliver, Thomas C.; and Stavely, Donald J., 5,010,536, Cl. 369-36.000.
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Pruett, Wayne P.; Meyer, Max F., Jr.; and Breeding, Kenneth E., 5,010,165, Cl. 528-272.000.
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Urich, Oren D.; and Meyer, Vernie G., 5,009,062, Cl. 56-341.000.
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Hendrickson, Alfred A.; and Smith, Darrell W., 5,009,842, Cl. 419-28.000.
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Lawrence, Ronald L.; and Miller, Mark R., 5,009,342, Cl. 222-136.000.
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Hanai, Kazumichi; Mine, Koichi; and Kikuta, Hikaru, 5,009,575, Cl. 417-244.000.
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Maruyama, Hiroshi; Kiryu, Naohiko; Minezaki, Etsuko; Tagashira, Susumu; and Shimokawahara, Hisashi, 5,009,944, Cl. 428-40.000.
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Kosugi, Yoshitsugu; Tanaka, Hideoki; Suzuki, Hideo; and Shiraki, Masaru, 5,010,004, Cl. 435-134.000.
Minklei, Alfred O.: *See*—
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Cole, Susan M., 5,009,224, Cl. 128-156.000.
Debe, Mark K., 5,009,948, Cl. 428-141.000.
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Hata, Kazuyoshi, 5,009,491, Cl. 350-427.000.
Higashio, Kimihiko; and Yoshikai, Takeshi, 5,010,363, Cl. 355-206.000.
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Matsuo, Hirokazu; and Nagato, Hiroyasu, 5,010,371, Cl. 355-313.000.
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Mirow, Fred. Resonant mode power supply with constant output voltage. 5,010,466, Cl. 363-16.000.
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Shigeta, Katsunori; and Nakamura, Haruyuki, 5,009,176, Cl. 112-121.120.
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Egami, Noritaka, 5,010,332, Cl. 340-825.500.
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Murao, Fumihide, 5,010,394, Cl. 358-29.000.
Murata, Shigemi, 5,010,263, Cl. 310-68.00B.
Nagao, Masashi, 5,009,072, Cl. 62-6.000.
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Okuda, Hiroshi; and Ozawa, Masayuki, 5,009,209, Cl. 123-415.000.
Sasaki, Yoshiyuki; Tsunashima, Kenji; Ookuma, Ikuo; and Fujii, Toshifumi, 5,010,404, Cl. 358-139.000.
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Shiba, Tetsuo, 5,010,381, Cl. 357-30.000.

Tanaka, Takao; and Odahara, Kazuhiro, 5,010,265, Cl. 310-88.000.
Yoshida, Susumu, 5,009,719, Cl. 136-249.000.
Yoshimoto, Masahiko; and Matsumura, Tetsuya, 5,010,519, Cl. 365-149.000.
Mitsubishi Electric Corporation: *See*—
Naito, Yasuo; Kouzuki, Hiroyuki; and Murai, Takeshi, 5,010,490, Cl. 364-426.040.
Mitsubishi Kasei Corporation: *See*—
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Kida, Michio; Arai, Yoshiaki; and Sahira, Kensho, 5,009,862, Cl. 422-249.000.
Mitsubishi Metal Corporation: *See*—
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Mitsubishi Nuclear Fuel Company, Ltd.: *See*—
Kirihara, Tomoo; Nakagawa, Ippei; Seki, Yoshinobu; Honda, Yutaka; and Ichihara, Yasuo, 5,009,751, Cl. 204-61.000.
Mitsubishi Paper Mills Limited: *See*—
Itoh, Akira; and Haino, Kozo, 5,009,976, Cl. 430-59.000.
Mitsubishi Petrochemical Co., Ltd.: *See*—
Hirose, Sachio; Hane, Motomu; and Inagawa, Masanobu, 5,010,174, Cl. 530-307.000.
Mitsubishi Rayon Co., Ltd.: *See*—
Yoshida, Keiji; Funato, Ryo; Takahiro, Syuji; Kubo, Shinji; and Inagaki, Notoshi, 5,009,978, Cl. 430-109.000.
Mitsui Engineering & Shipbuilding Co., Ltd.: *See*—
Hirano, Yoshinao; Sato, Katsumo; Nagamori, Shigeru; Murata, Katsuhide; Horikiri, Kazuhito; and Shirai, Junji, 5,009,585, Cl. 425-174.400.
Mitsui Mining & Smelting Co.: *See*—
Yamada, Shinjiro; Satoh, Seiki; Mabuchi, Kazuichi; Kitao, Shiei; and Egawa, Yoshiaki, 5,010,264, Cl. 310-72.000.
Mitsui Petrochemical Industries, Ltd.: *See*—
Kohsaka, Masaki; Higashi, Isaburou; Akana, Yoshinori; Hashimoto, Mikio; and Yatsu, Tadao, 5,010,146, Cl. 525-439.000.
Morinaga, Akio; and Kigami, Takeo, 5,010,132, Cl. 524-601.000.
Mitsui Toatsu Chemicals, Inc.: *See*—
Aoki, Masaaki; Kamiyama, Masayuki; Asai, Kiyotsugu; and Yamaguchi, Akihiro, 5,010,161, Cl. 528-59.000.
Mitsumori, Kazuya: *See*—
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Miyachi, Tsuneharu: *See*—
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Miyagoshi, Katsunobu: *See*—
Abe, Ryoji; Okita, Junichi; Miyagoshi, Katsunobu; and Hashiyama, Kouichi, 5,009,205, Cl. 123-195.00H.
Miyaji, Itsuo: *See*—
Endo, Mineyo; Takegami, Kiyoyoshi; Hishida, Noriaki; and Miyaji, Itsuo, 5,009,436, Cl. 277-80.000.
Miyake, Masaya: *See*—
Sasame, Akira; Sakanoue, Hitoyuki; Takeuchi, Hisao; Miyake, Masaya; Yamakawa, Akira; Yushio, Yasuhisa; and Akazawa, Hitoshi, 5,010,388, Cl. 357-70.000.
Miyake, Takashi: *See*—
Utsugi, Nobuo; Kihara, Hisashi; Mori, Shuichi; Fuse, Junichi; Miyake, Takashi; and Ikata, Yoshikatsu, 5,010,437, Cl. 360-137.000.
Miyake, Toru: *See*—
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Miyamoto, Hidenori, to Nikon Corporation. Predetermined magnification photographing apparatus for a camera. 5,010,358, Cl. 354-402.000.
Miyamoto, Shoji: *See*—
Mori, Kinji; Kunai, Yuko; Akiyama, Masakazu; Kadoya, Tadaaki; Kawano, Katsumi; Miyamoto, Shoji; Nohmi, Makoto; Shingai, Sadanori; and Ihara, Hirokazu, 5,010,479, Cl. 364-200.000.
Miyamoto, Toshio: *See*—
Araya, Junji; Ohzeki, Yukihiro; Miyamoto, Toshio; Hiroshima, Koichi; Sato, Yasushi; and Nakahata, Kimio, 5,010,370, Cl. 355-274.000.
Miyata, Hidenobu, to GFK GmbH. Video printer. 5,010,498, Cl. 364-519.000.
Mizumura, Yutaka: *See*—
Yatsuka, Takeshi; Murata, Hiroshi; Mizumura, Yutaka; and Kotera, Nobukazu, 5,009,960, Cl. 428-423.100.
Mizuno, Tsuyoshi; and Hirano, Motoki, to Nissan Motor Company, Ltd. Plane patch antenna. 5,010,349, Cl. 343-700.0MS.
MNY Holdings and Agencies Limited: *See*—
Grinberg, Oded, 5,009,164, Cl. 102-502.000.
Moberg, Gregory O., to Eastman Kodak Company. Method and apparatus for driving a DC motor. 5,010,282, Cl. 318-254.000.
Mobil Oil Corporation: *See*—
Avidan, Amos A.; and Yurchak, Sergei, 5,009,851, Cl. 422-141.000.
Bartilucci, Mark P.; Karsner, Grant G.; and Tracy, William J., III, 5,009,767, Cl. 208-85.000.
Harandi, Mohsen N.; and Owen, Hartley, 5,009,859, Cl. 422-189.000.
Kovacs, Richard C.; Krambeck, Frederick J.; and Sarli, Michael S., 5,009,853, Cl. 422-144.000.
Linville, Andrew F., Jr.; and Shirley, Thomas E., 5,010,526, Cl. 367-46.000.
Mobil Solar Energy Corporation: *See*—
Vayman, Zinovy Y., 5,010,040, Cl. 437-230.000.
Mobley, Dewey F.; Peterson, Robert G., Sr.; and LaCava, James E., to Interlock Corporation. Terminal assembly with fixed and flexible tab receptacle retainers. 5,009,615, Cl. 439-595.000.
Modern Industries, Inc.: *See*—
Barrios, Richard C.; and Hayes, Philip A., 5,008,967, Cl. 14-7.000.
Moeller, Randolph C.: *See*—
Sliger, Kris M.; Moeller, Randolph C.; and Williamson, Scott E., 5,009,264, Cl. 166-106.000.
Mohanty, Dillip K.: *See*—
Famili, Amir F.; Marten, F. Lennart; and Mohanty, Dillip K., 5,010,153, Cl. 526-243.000.
Mohnot, Shantilal M.: *See*—
Johnson, Harlan B.; Laferty, Samuel B.; Wagner, Melvin P.; and Mohnot, Shantilal M., 5,009,971, Cl. 429-252.000.
Molaug, Ole; and Risa, Steinar, to Akva A/S. Method of pelleting dry pellets from a mixture containing thermo-hardened ingredients, particularly for use as fish feed, and the machine for carrying out the process. 5,009,908, Cl. 426-454.000.
Mold-Masters Limited: *See*—
Schmidt, Harald H., 5,009,718, Cl. 136-232.000.
Molex Incorporated: *See*—
Plocek, Edward J.; Weiss, Stephen Z.; and Pike-Biegunski, Maciej, 5,009,604, Cl. 439-15.000.
Regnier, Kent, 5,009,611, Cl. 439-326.000.
Rishworth, Paul L.; Rishworth, Denis L.; and Dixon, Daniel A., 5,009,612, Cl. 439-403.000.
Molini, Alberto E. Method of recovering energy from ocean water. 5,009,069, Cl. 60-641.100.
Moll, Franz: *See*—
Scheerer, Rainer; and Moll, Franz, 5,009,990, Cl. 430-539.000.
Mollier, Pierre: *See*—
Boudon, Gerard; Mollier, Pierre; Nuez, Jean-Paul; Ong, Ieng; Tannhof, Pascal; and Wallart, Franck, 5,010,257, Cl. 307-446.000.
Monarch Marking Systems, Inc.: *See*—
Goodwin, Brent E.; Karn, Donald L.; and Mistyurik, John D., 5,009,739, Cl. 156-384.000.
Monroe, James A.: *See*—
Newman, Jack; and Monroe, James A., 5,009,637, Cl. 604-68.000.
Monsanto Company: *See*—
Ebner, Jerry R.; and Gleaves, John T., 5,009,849, Cl. 422-83.000.
Hardiman, Christopher J., 5,010,154, Cl. 526-135.000.
Iwaszkowiec, Carlos, 5,009,369, Cl. 239-223.000.
Montangero, Paolo: *See*—
Braglia, Marco; DeFranceschi, Roberto; and Montangero, Paolo, 5,010,253, Cl. 250-399.000.
Montgomery, Gary V.; and Beck, Terry E., to Sunbeam Plastics Corporation. Tamper indicating closure having a rotary seal. 5,009,323, Cl. 215-252.000.
Moody, Paul E., to United States of America, Navy. Submarine torpedo tube shutterway launch mode adapter. 5,009,182, Cl. 114-238.000.
Mooney, Gerry: *See*—
Kosin, John A.; Mooney, Gerry; Tarquini, Michael A.; and Garcia, Rod A., 5,009,809, Cl. 252-350.000.
Wason, Satish K.; Mooney, Gerry; Andrews, Claude R.; Tarquini, Michael E.; Kosin, John A.; and Garcia, Rod A., 5,009,810, Cl. 252-350.000.
Moore, John F., to Kabushiki Kaisha Toshiba. System for communicating energy between relatively moving devices. 5,010,254, Cl. 250-551.000.
Moore, Richard C.: *See*—
Dekeyser, Mark A.; and Moore, Richard C., 5,010,068, Cl. 514-79.000.
Moore, Wayne D.: *See*—
Raikes, Terry E.; Kramer, William L.; Howard, John H.; Moore, Wayne D.; Jackson, Louis; and Kotecki, Jeffrey D., 5,009,276, Cl. 177-25.150.
Morales, Alfredo: *See*—
Galiasso, Roberto; Morales, Alfredo; and Salazar, Jose A., 5,009,768, Cl. 208-89.000.
Moran, Larry K.; and Murray, Thomas R., to Conoco Inc. Well cement fluid loss additive and method. 5,009,269, Cl. 166-293.000.
Moran, Susan C.: *See*—
Abu-Isa, Ismat A.; Eusebi, Elio; Jaynes, Craig B.; Moran, Susan C.; and Roy, Michael A., 5,009,827, Cl. 264-156.000.
Morand, Michel, to Wyant & Company Limited. Bathroom tissue dispenser (spindle release). 5,009,313, Cl. 206-391.000.
Morane, Bruno, to L'Oreal. Packaging container using a system of fermentation to produce a propulsive gas. 5,009,340, Cl. 222-94.000.
Moreau, Sylviane: *See*—
Kim, Sun H.; and Moreau, Sylviane, 5,010,089, Cl. 514-314.000.
Morgan, Charles R. Reverse diffusing baffle for applying sprout inhibitor to stored potatoes. 5,009,152, Cl. 99-476.000.
Morgan, Cheryle L.; and Judy, Millard M. Medical sponges and wipes with a barrier impermeable to infectious agents. 5,009,652, Cl. 604-385.100.
Mori, Kinji; Kunai, Yuko; Akiyama, Masakazu; Kadoya, Tadaaki; Kawano, Katsumi; Miyamoto, Shoji; Nohmi, Makoto; Shingai, Sadanori; and Ihara, Hirokazu, to Hitachi, Ltd. Information processing and storage system with signal transmission loop line. 5,010,479, Cl. 364-200.000.

Mori, Shuichi: *See*—
Utsugi, Nobuo; Kihara, Hisashi; Mori, Shuichi; Fuse, Junichi; Miyake, Takashi; and Ikata, Yoshikatsu, 5,010,437, Cl. 360-137.000.

Morikawa, Kiyoshi: *See*—
Kobayashi, Kazuo; Morikawa, Kiyoshi; Yamada, Yoshinori; Kurumada, Masakazu; and Sugihara, Masanori, 5,010,484, Cl. 369-77.200.

Morikawa, Koji, to Fuji Jukogyo Kabushiki Kaisha. Two-cycle engine having a direct fuel injection system. 5,009,201, Cl. 123-65.0BA.

Morikuni, Mitsuru: *See*—
Matsumoto, Kenji; Yanagita, Tomoatsu; Nishiyama, Yoshinori; Nagai, Masahiko; and Morikuni, Mitsuru, 5,010,493, Cl. 364-490.000.

Morimoto, Akira, to Asahi Kogaku Kogyo Kabushiki Kaisha. Light scanning device with polarizing device to make light transmission more uniform. 5,009,472, Cl. 350-6.500.

Morimoto, Yoshihiko; and Kohno, Tetsushi, to Fuji Jukogyo Kabushiki Kaisha. Transmission ratio control system for a continuously variable transmission. 5,009,127, Cl. 74-866.000.

Morimoto, Yoshihiko; and Kohno, Tetsushi, to Fuji Jukogyo Kabushiki Kaisha. Transmission ratio control system for a continuously variable transmission. 5,009,129, Cl. 74-866.000.

Morin, Carl F.: *See*—
Benin, Joshua; Di Maio, William G.; Morin, Carl F.; and Lawler, James A., 5,009,942, Cl. 428-36.600.

Morinaga, Akio; and Kigami, Takeo, to Mitsui Petrochemical Industries, Ltd. Water-base paint for coating the inside surface of metallic can. 5,010,132, Cl. 524-601.000.

Morinaga, Tetsuya: *See*—
Kaneko, Toshimi; Morinaga, Tetsuya; and Hatakenaka, Tetsuo, 5,010,313, Cl. 335-296.000.

Morita, Kaoru; and Shioda, Atsushi, to Kansai Paint Co., Ltd. Can interior coating composition. 5,010,149, Cl. 525-481.000.

Morita, Shigetoshi: *See*—
Taguchi, Akira; Morita, Shigetoshi; Taka, Shunichi; Yamada, Hirohide; Takada, Yoshiaki; Furuichi, Shinji; and Ao, Masahiro, 5,010,429, Cl. 360-103.000.

Morita, Tsutomu: *See*—
Tsuyuguchi, Hiroshi; Noda, Yasushi; Morita, Tsutomu; and Shimozawa, Kenji, 5,010,246, Cl. 250-216.000.

Morita, Yuzo: *See*—
Yoneda, Kenzi; Ueshima, Takaaki; Kuzunuki, Soshiro; Morita, Yuzo; and Tobita, Toshimitsu, 5,010,472, Cl. 364-148.000.

Moriwaki, Masafumi; Sano, Shigeaki; Hatakeyama, Katsunori; Yamada, Hiroshi; and Nouno, Youzou, to Toppan Moore Company, Ltd. Signal input sheet. 5,010,213, Cl. 178-18.000.

Moriya, Naoko: *See*—
Watanabe, Taichi; Ogino, Hidekazu; Hirota, Hajime; Koshika, Tomohito; Moriya, Naoko; and Nozaki, Toshio, 5,009,813, Cl. 252-545.000.

Morningstar, Leroy J.: *See*—
Fogg, Michael W.; and Morningstar, Leroy J., 5,009,616, Cl. 439-608.000.

Morris, Christopher J.; Coulson, Ian; and Surguy, Paul W. H., to Thorn EMI plc. Display device. 5,010,328, Cl. 340-784.000.

Morris, James K. Jacketed paint pellet. 5,009,165, Cl. 102-513.000.

Morris, Robert C.: *See*—
Damgaard-Iversen, Karsten; Morris, Robert C.; Chin, Timothy C.; and Kuper, Jerry W., 5,009,658, Cl. 606-128.000.

Morrison, Daryl K.: *See*—
Elias, Samir F.; and Morrison, Daryl K., 5,010,129, Cl. 524-413.000.

Morrison, Shawn J., to Northern Telecom Limited. Optical fiber coupling device and method for its use. 5,009,479, Cl. 350-96.150.

Mortimore, David B.; and Payne, David B., to British Telecommunications public limited company. Optical two-way transmission system with loop reflector modulator. 5,010,586, Cl. 455-605.000.

Mosele, John L.; and Stolpe, Lars O., to Jelp, Inc. Temporary traffic light control. 5,010,336, Cl. 340-907.000.

Moss, Gaylord E.: *See*—
Shih, I-Fu; Chang, David B.; Arns, James A.; Moss, Gaylord E.; and Smith, Ronald T., 5,009,502, Cl. 356-152.000.

Motoi, Toshihiro: *See*—
Murahashi, Takashi; Nakazawa, Toshihiko; Takesue, Toshihiro; and Motoi, Toshihiro, 5,010,353, Cl. 346-108.000.

Motorola, Inc.: *See*—
Braun, Jeffrey J., 5,010,303, Cl. 330-257.000.
Johnson, Richard E.; Kabcenell, Amy R.; and DeLuca, Joan S., 5,010,547, Cl. 370-94.100.
Kobylarz, Daniel E.; and Ford, David K., 5,010,570, Cl. 379-390.000.
Kuhl, Virgil F.; and Noll, Guenter, 5,008,988, Cl. 24-510.000.
Manssen, Keith R.; and Moutrie, Michael F., 5,010,309, Cl. 333-206.000.
Parken, William D., 5,010,583, Cl. 455-9.000.
Pfiester, James R.; and Hayden, James D., 5,010,030, Cl. 437-192.000.
Schwendeman, Robert J.; and Kuznicki, William J., 5,010,317, Cl. 340-311.100.
Snowden, Gregory O.; Barrett, Clifford E., III; and Gomez, Fernando, 5,010,330, Cl. 340-825.210.

Motoyama, Shimesu: *See*—
Niwa, Kozo; and Motoyama, Shimesu, 5,009,891, Cl. 424-195.100.

Mott, Philip J.: *See*—
Ivey, John S.; Bateman, Paul M.; Clauss, Julius A.; Cole, Edward H., Jr.; and Mott, Philip J., 5,009,631, Cl. 474-213.000.

Motykiewicz, Krystyn, to Rostra Engineered Components. Solenoid actuators. 5,010,312, Cl. 335-261.000.

Moulin, Claude: *See*—
Ferrua, Bernard; and Moulin, Claude, 5,010,017, Cl. 436-500.000.

Mouri, Takayuki, to Ikeda Bussan Co., Ltd. Vehicle seat with seatbelt buckler receiver. 5,009,469, Cl. 297-468.000.

Moutrie, Michael F.: *See*—
Manssen, Keith R.; and Moutrie, Michael F., 5,010,309, Cl. 333-206.000.

Mowforth, Clive W.; Bullock, James F.; Maternaghan, Trevor J.; and Harvey, Karen N., to Ilford Limited. Silver halide emulsions containing twinned silver halide crystals. 5,009,991, Cl. 430-567.000.

MRA Laboratories, Inc.: *See*—
Maher, Galeb H., 5,010,443, Cl. 361-321.000.

Muellenberg, Ralph. Clamping set with screw sleeve. 5,009,539, Cl. 403-370.000.

Mueller, Carl F.: *See*—
Garg, Diwakar; Mueller, Carl F.; Schaffer, Leslie E.; and Dyer, Paul N., 5,009,966, Cl. 428-627.000.

Mueller, Hans R.; Ulmann, Martin; Conti, Josef; and Muerdel, Guenter, to Eprova AG. Method for the resolution of folinic acid. 5,010,194, Cl. 544-258.000.

Mueller, Karl F., to Ciba-Geigy Corporation. Reactive silicone and/or fluorine containing hydrophilic prepolymers and polymers thereof. 5,010,141, Cl. 525-276.000.

Mueller, Karl F., to Ciba-Geigy Corporation. Vinyl-urethane substituted hydroxyethyl cellulose. 5,010,155, Cl. 527-301.000.

Mueller, Otward M.; and Edelstein, William A., to General Electric Company. Cryogenically-cooled radio-frequency power amplifier. 5,010,304, Cl. 330-269.000.

Mueller, Richard A.: *See*—
Fuller, George C.; Martin, George R.; Mueller, Richard A.; and Reich, Reuven, 5,010,080, Cl. 514-255.000.

Mueller, Timothy T. Sculpture apparatus. 5,009,599, Cl. 434-81.000.

Muerdel, Guenter: *See*—
Mueller, Hans R.; Ulmann, Martin; Conti, Josef; and Muerdel, Guenter, 5,010,194, Cl. 544-258.000.

Muirfield Holdings L.P.: *See*—
Freidel, Kenneth; Littleton, L. Arthur; and Freund, William G., 5,009,693, Cl. 65-107.000.

Mukai, Tadayoshi; and Yoshino, Akira, to Matsushita Electric Works, Ltd. Induction motor control system. 5,010,287, Cl. 318-801.000.

Mukai, Toshio: *See*—
Sakamoto, Hiroaki; Fujikura, Masahiro; and Mukai, Toshio, 5,009,706, Cl. 75-244.000.

Mukoyama, Yoshiyuki: *See*—
Tanaka, Kazuyuki; Iwami, Etsuji; Matsuzawa, Jun; Mukoyama, Yoshiyuki; Shibata, Noriohiko; Hanawa, Akinori; and Yokota, Mitsuo, 5,009,949, Cl. 428-260.000.

Muller, Eugenio: *See*—
Boghen, Franklin M.; Camanni, Franco; Del Soldato, Piero; Ghigo, Ezio; and Muller, Eugenio, 5,010,056, Cl. 514-12.000.

Muller, German, to Industrie Automation Sondertechnik GmbH & Co. Process for the separation of heavy metals from waste materials. 5,009,793, Cl. 210-710.000.

Muller, Hans-Werner: *See*—
Traubel, Harro; Strenger, Heinrich; Weber, Karl A.; Muller, Hans-Werner; Zapfel, Horst; and Hummel, Axel, 5,009,921, Cl. 427-31.000.

Muller, Heinz: *See*—
Glockler, Gerhard; Muller, Heinz; Kepplinger, Leopold W.; Matzawrakos, Panajiotis; Koch, Erwin; and Auberger, Heinrich, 5,009,397, Cl. 266-197.000.

Mullverbrennungsanlage Wuppertal GmbH: *See*—
Temelli, Sedat, 5,009,173, Cl. 110-244.000.

Multiform Desiccants, Inc.: *See*—
Cullen, John S.; Incorvia, Samuel A.; Nigon, Christopher S.; and Vaylen, Nicholas E., 5,009,308, Cl. 206-204.000.

Multisource Technology Corp.: *See*—
Estrov, Alexander, 5,010,314, Cl. 336-198.000.

Munie, Gregory C.: *See*—
Dodd, Courtney V.; and Munie, Gregory C., 5,009,724, Cl. 148-23.000.

Murahashi, Takashi; Nakazawa, Toshihiko; Takesue, Toshihiro; and Motoi, Toshihiro, to Konica Corporation. Laser recorder with integrally molded deflector. 5,010,353, Cl. 346-108.000.

Murai, Keiichi: *See*—
Honda, Mitsuru; Koike, Atsushi; Kimura, Tomohiro; Ogawa, Kyosuke; and Murai, Keiichi, 5,009,974, Cl. 430-69.000.

Murai, Takeshi: *See*—
Naito, Yasuo; Kouzuki, Hiroyuki; and Murai, Takeshi, 5,010,490, Cl. 364-426.040.

Murakami, Masakazu: *See*—
Uehara, Katsuhiro; Kurita, Masanori; and Murakami, Masakazu, 5,009,584, Cl. 425-135.000.

Murakami, Tokumichi; Asai, Kohtaro; Kamizawa, Koh; Nishida, Masami; Yamazaki, Eizo; Itoh, Atsushi; and Kinjoh, Naoto, to Mitsubishi Denki Kabushiki Kaisha. Picture coding and decoding apparatus using vector quantization. 5,010,401, Cl. 358-136.000.

Murao, Fumihide, to Mitsubishi Denki Kabushiki Kaisha. Automatic white balance circuit capable of effectively adjusting white balance under a flashing light source. 5,010,394, Cl. 358-29.000.

Muraoka, Takao: *See*—
Yamada, Takehito; Tanimoto, Kazushi; Sakai, Yuji; Muraoka, Takao; Inoue, Tetsuo; and Takada, Yoshinao, 5,010,430, Cl. 360-103.000.

Murata, Hiroshi: *See*—
Yatsuka, Takeshi; Murata, Hiroshi; Mizumura, Yutaka; and Kotera, Nobukazu, 5,009,960, Cl. 428-423.100.

Murata, Katsuhide: *See*—
Hirano, Yoshinao; Sato, Katsumo; Nagamori, Shigeru; Murata, Katsuhide; Horikiri, Kazuhito; and Shirai, Junji, 5,009,585, Cl. 425-174.400.

Murata, Kouji: *See*—
Honkura, Yoshinobu; Matsuo, Toru; and Murata, Kouji, 5,009,723, Cl. 148-12.00E.

Murata Manufacturing Co., Ltd.: *See*—
Kaneko, Toshimi; Morinaga, Tetsuya; and Hatakenaka, Tetsuo, 5,010,313, Cl. 335-296.000.
Mandai, Harufumi; Tanaka, Yukio; Takakura, Shinichi; and Nakagawa, Takuji, 5,009,744, Cl. 156-656.000.

Murata, Shigemi, to Mitsubishi Denki Kabushiki Kaisha. Hall effect type sensing device. 5,010,263, Cl. 310-68.00B.

Murata, Yoshiyuki: *See*—
Manabe, Hajime; and Murata, Yoshiyuki, 5,009,146, Cl. 84-615.000.

Murdoch, James B.: *See*—
Paley, Martyn N. J.; Murdoch, James B.; Lampman, David A.; and McNally, James M., 5,010,300, Cl. 324-309.000.

Murphy, Martin J., Jr.; Stubbs, Jack B.; and Leonard, Thomas A., to Hipple Cancer Research Corporation. Automated capillary scanning system. 5,009,503, Cl. 356-339.000.

Murray, Thomas R.: *See*—
Moran, Larry K.; and Murray, Thomas R., 5,009,269, Cl. 166-293.000.

Murray, William D.: *See*—
Duff, Sheldon J. B.; and Murray, William D., 5,010,005, Cl. 435-147.000.

Muskegon Automation Equipment, Inc.: *See*—
Johnson, Bruce R., 5,008,995, Cl. 29-252.000.

Musyck, Christian E.: *See*—
Musyck, Emile P.; and Musyck, Christian E., 5,010,573, Cl. 380-28.000.

Musyck, Emile P.; and Musyck, Christian E. Cryptographic system by blocs of binery data. 5,010,573, Cl. 380-28.000.

Nabisco Brands, Inc.: *See*—
Levine, Harry; Slade, Louise; Van Lengerich, Bernhard; and Pickup, John G., 5,009,900, Cl. 426-96.000.

Nagai, Masahiko: *See*—
Matsumoto, Kenji; Yanagita, Tomoatsu; Nishiyama, Yoshinori; Nagai, Masahiko; and Morikuni, Mitsuru, 5,010,493, Cl. 364-490.000.

Nagakura, Kaoru, to Fujitsu Limited. Block polling data communication system having optimum block determination means. 5,010,329, Cl. 340-825.080.

Nagamori, Shigeru: *See*—
Hirano, Yoshinao; Sato, Katsumo; Nagamori, Shigeru; Murata, Katsuhide; Horikiri, Kazuhito; and Shirai, Junji, 5,009,585, Cl. 425-174.400.

Nagano, Masashi, to Shimano Industrial Company Limited. Brake control apparatus for bicycle. 5,009,119, Cl. 74-489.000.

Naganuma, Hiroshi; Sato, Kenji; Yamamoto, Masashi; Kubota, Toshiaki; Hayashi, Hiroshige; and Ishizaka, Yoshirou, to Sanyo Electric Co., Ltd. Low-temperature show case. 5,009,080, Cl. 62-256.000.

Nagao, Masashi, to Mitsubishi Denki Kabushiki Kaisha. Refrigerator. 5,009,072, Cl. 62-6.000.

Nagashima, Shigeo: *See*—
Omoda, Koichiro; Tanaka, Teruo; Nakagoshi, Junji; Hamanaka, Naoki; and Nagashima, Shigeo, 5,010,477, Cl. 364-200.000.

Nagata, Osamu: *See*—
Yamamoto, Takemi; Nagata, Osamu; Komiya, Ryohei; Sakai, Jun; and Ban, Yoshiyuki, 5,010,360, Cl. 355-20.000.

Nagata, Shinichi: *See*—
Endo, Kenji; and Nagata, Shinichi, 5,010,465, Cl. 362-337.000.

Nagato, Hiroyasu: *See*—
Matsuo, Hirokazu; and Nagato, Hiroyasu, 5,010,371, Cl. 355-313.000.

Nagato, Mitsuo: *See*—
Yamazaki, Katsunori; and Nagato, Mitsuo, 5,010,326, Cl. 340-784.000.

Nagengast, William E.: *See*—
Luallin, John M.; Nagengast, William E.; and Roeske, Robert G., 5,010,455, Cl. 362-61.000.

Nagpal, Amit: *See*—
Dieter, Douglas K., 5,009,266, Cl. 166-245.000.

Nagy, Michael E., to International Business Machines Corporation. Method of decoding compressed data. 5,010,344, Cl. 341-65.000.

Nagy, Michael E., to International Business Machines Corporation. Data compression method. 5,010,345, Cl. 341-65.000.

Nair, Muraleedharan G.: *See*—
Ries, Stanley K.; Wert, Violet F.; and Nair, Muraleedharan G., 5,009,698, Cl. 71-92.000.

Naito, Yasuo; Kouzuki, Hiroyuki; and Murai, Takeshi, to Mitsubishi Electric Corporation; and Mazda Motor Corporation. Constant speed control apparatus for motor vehicle. 5,010,490, Cl. 364-426.040.

Nakagawa, Hiroshi; and Maeda, Minoru, to Shinko Electric Company Ltd. Strong magnetic thrust force type actuator. 5,010,262, Cl. 310-12.000.

Nakagawa, Ippei: *See*—
Kirihara, Tomoo; Nakagawa, Ippei; Seki, Yoshinobu; Honda, Yutaka; and Ichihara, Yasuo, 5,009,751, Cl. 204-61.000.

Nakagawa, Takerou: *See*—
Kanehira, Makoto; Nakagawa, Takerou; Tsubakimoto, Yasumasa; Tanaka, Kouji; Takahashi, Toshio; and Ikeda, Masaaki, 5,009,630, Cl. 474-211.000.

Nakagawa, Takuji: *See*—
Mandai, Harufumi; Tanaka, Yukio; Takakura, Shinichi; and Nakagawa, Takuji, 5,009,744, Cl. 156-656.000.

Nakagawa, Toyoaki; Sanbuichi, Hiroshi; Terasaka, Katsunori; and Saito, Makoto, to Nissan Motor Co., Ltd. Air/fuel ratio feedback control system for lean combustion engine. 5,009,210, Cl. 123-489.000.

Nakagoshi, Junji: *See*—
Omoda, Koichiro; Tanaka, Teruo; Nakagoshi, Junji; Hamanaka, Naoki; and Nagashima, Shigeo, 5,010,477, Cl. 364-200.000.

Nakahama, Tadamitsu: *See*—
Yamane, Takakazu; Tanimoto, Yoshio; and Nakahama, Tadamitsu, 5,009,931, Cl. 427-195.000.

Nakahara, Toshiaki: *See*—
Yoshida, Satoshi; Nakahara, Toshiaki; Tanikawa, Hirohide; and Sakashita, Kiichiro, 5,009,973, Cl. 430-45.000.

Nakahata, Kimio: *See*—
Araya, Junji; Ohzeki, Yukihiro; Miyamoto, Toshio; Hiroshima, Koichi; Sato, Yasushi; and Nakahata, Kimio, 5,010,370, Cl. 355-274.000.

Nakai, Hiroto: *See*—
Minagawa, Hidenobu; Tatsumi, Yuuichi; Iwahashi, Hiroshi; Asano, Masamichi; Nakai, Hiroto; and Imai, Mizuho, 5,010,520, Cl. 365-174.000.

Nakai, Keiichiro; and Nakanishi, Yoshinori, to Otis Elevator Company. Sheave array arrangement for elevator. 5,009,288, Cl. 187-20.000.

Nakamura, Haruyuki: *See*—
Shigeta, Katsunori; and Nakamura, Haruyuki, 5,009,176, Cl. 112-121.120.

Nakamura, Hiroto: *See*—
Takei, Katsumori; Fukushima, Hitoshi; Iwamoto, Kohei; and Nakamura, Hiroto, 5,010,352, Cl. 346-76.0PH.

Nakamura, Hitoshi: *See*—
Kitada, Masahiro; Shimizu, Noboru; Tanabe, Hideo; and Nakamura, Hitoshi, 5,010,433, Cl. 360-113.000.

Nakamura, Kosei; Kono, Shinichi; Numai, Kazuhisa; and Kimijima, Masami, to Fanuc Ltd. Method of synchronous control of spindle motor and feed motor. 5,010,286, Cl. 318-571.000.

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Ikeda, Hayato; Sawada, Masahiro; Nakamura, Norihiko; and Yokomachi, Naoya, 5,009,286, Cl. 184-6.170.
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Nakai, Keiichiro; and Nakanishi, Yoshinori, 5,009,288, Cl. 187-20.000.

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Masaki, Shouichi; Fukushima, Akira; Fujimoto, Shusaku; and Nakano, Makoto, 5,010,489, Cl. 364-426.020.

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Nakasato, Yoshisuke: *See*—
Suzuki, Fumio; Kuroda, Takeshi; Nakasato, Yoshisuke; Ohmori, Kenji; and Manabe, Haruhiko, 5,010,084, Cl. 514-293.000.

Nakazawa, Eiji: *See*—
Hasegawa, Takanori; Abe, Nobuyuki; Hibara, Toru; Hirose, Toshihiko; Kanda, Takashi; Saito, Hiroshi; Oshima, Masaki; and Nakazawa, Eiji, 5,010,420, Cl. 358-471.000.

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Murahashi, Takashi; Nakazawa, Toshihiko; Takesue, Toshihiro; and Motoi, Toshihiro, 5,010,353, Cl. 346-108.000.

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Kerr, E. Michael; Connelly, Lawrence J.; Roe, William J.; and Vallowe, Robert M., 5,009,873, Cl. 423-320.000.
Syrinek, Allen R.; Buggs, Ralph N.; and Gabel, Robert K., 5,009,799, Cl. 252-8.553.
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Chiang, Wen-Yen; and Hu, Chun-Min, 5,010,134, Cl. 525-57.000.

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Phy, William S., 5,008,997, Cl. 29-827.000.

National Semiconductor Corporation: *See—*
Manoliu, Juliana, 5,010,034, Cl. 437-89.000.

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Kronfli, Esam; Lovell, Keith V.; Hooper, Alan; and Neat, Robin J., 5,009,970, Cl. 429-192.000.

NEC Corporation: *See—*
Hazawa, Osamu, 5,010,475, Cl. 364-200.000.
Hirata, Yoshimi, 5,010,550, Cl. 371-8.200.
Ishida, Tomoyuki, 5,010,481, Cl. 364-200.000.
Seki, Kenji, 5,010,584, Cl. 455-83.000.
Yukawa, Akira, 5,010,347, Cl. 341-143.000.

Neddermeyer, Robert N.: *See—*
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Nedoseka, Anatoly Y.: *See—*
Paton, Boris E.; Utkin, Vladimir F.; Nedoseka, Anatoly Y.; Khromyak, Nikolai T.; Gorlitsyn, Nikolai V.; Tikhy, Viktor G.; Mezintsev, Evgeny D.; and Mezhuev, Nikolai N., 5,010,503, Cl. 364-569.000.

Neef, Gunter: *See—*
Braestrup, Claus T.; Nielsen, Mogens C.; Christensen, Joergen A.; Engelstoft, Mogens; Schou, Henning; Eder, Ulrich; Neef, Gunter; Huth, Andreas; Rahtz, Dieter; and Schmiechen, Ralph, 5,010,077, Cl. 514-228.800.

Neel, Robert M.: *See—*
Eilert, Randall N.; Neel, Robert M.; Harvey, N. Thatcher; Ames, Wilbur R., IV; and Lord, Randall D., 5,008,974, Cl. 16-114.00R.

Neff, Gregor N. Aquatic cage and method. 5,009,189, Cl. 119-3.000.

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Yamauchi, Hiroshi; Sugiyama, Isao; Saito, Isao; Nomoto, Seiichiro; Kamiya, Takashi; Machida, Yoshimasa; and Negi, Shigeto, 5,010,188, Cl. 540-222.000.

Negishi, Akihito: *See—*
Akizawa, Nobuyuki; Kudo, Yasunori; Kanai, Toshiyuki; Kamei, Yasuo; Oyama, Nobuaki; and Negishi, Akihito, 5,009,355, Cl. 227-114.000.

Nelson, Jerry T. Adjustable gun butt. 5,009,021, Cl. 42-73.000.

Nelson, Joyce K.: *See—*
Bikson, Benjamin; Nelson, Joyce K.; and Perrin, Jerry E., 5,009,678, Cl. 55-16.000.

Nelson, Kenneth E.: *See—*
Holtan, Ramer B., Jr.; Falk, Kevin L.; Bergman, James F.; Smith, James R.; and Nelson, Kenneth E., 5,009,496, Cl. 351-156.000.

Nelson, Michael T.: *See—*
Shirey, Roy D.; Nelson, Michael T.; and Laurenzi, Robert J., 5,010,224, Cl. 219-69.170.

Nelson, Robert M.: *See—*
Cloyd, Willard C.; and Nelson, Robert M., 5,009,927, Cl. 427-121.000.

Nelson, Stephen R.; and Hood, Richard L., to Kerr-McGee Corporation. Solvent extraction process. 5,009,772, Cl. 208-309.000.

Nesbitt, R. Dennis: *See—*
Stiefel, Joseph F.; Melvin, Terence; and Nesbitt, R. Dennis, 5,009,427, Cl. 273-232.000.

Nesseth, Raymond P.: *See—*
Coleman, Darold D.; and Nesseth, Raymond P., 5,009,545, Cl. 404-100.000.

Nestec S.A.: *See—*
Clairouin, Noel; Gueroult, Alain; and Lemoyne, Remi, 5,009,918, Cl. 426-643.000.

Netravali, Aran N.: *See—*
Schreiber, William F.; Lippman, Andrew B.; Adelson, Edward H.; and Netravali, Aran N., 5,010,405, Cl. 358-141.000.

Netravali, Arun N.: *See—*
Alferness, Rodney C.; Budrikis, Zigmantas L.; Hagelbarger, David W.; Kogelnik, Herwig W.; and Netravali, Arun N., 5,009,477, Cl. 350-96.150.

New Life Foundation: *See—*
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Newey, Roger: *See—*
Janney, Mark A.; Newey, Roger; and Robinson, Irwin J., III, 5,010,560, Cl. 377-20.000.

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Gatchel, Gary; Newgarden, Joseph E.; and Lynn, Gordon E., 5,009,421, Cl. 273-30.000.

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Newman, Neil A.: *See—*
Bankstahl, Herbert A.; Forsgren, Lyle M.; Newman, Neil A.; Beck, Wayne T.; and Griffiths, John M., 5,009,621, Cl. 440-75.000.

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Worschech, Kurt; Wedl, Peter; Fleischer, Erwin; Loeffelholz, Frido; and Jaeckel, Manfred, 5,010,123, Cl. 524-114.000.

Neyrpic Framatome Mecanique: *See—*
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NGK Insulators, Ltd.: *See—*
Oshima, Shinji; and Misawa, Hidenobu, 5,009,832, Cl. 264-571.000.

Nguyen, Tho Q.; and Casadei, Alberto L., to Westinghouse Electric Corp. Axially modular fuel assembly and rod for optimal fuel utilization. 5,009,837, Cl. 376-261.000.

Nickel, Klaus-Dietrich, to Citadel Investments Limited. Rotary disintegrating device. 5,009,371, Cl. 241-187.000.

Nickerson, Mark A.; Poole, John S.; and Frank, Lenore G. R., to Hewlett-Packard Company. Axially-driven valve controlled fluid trapping assembly. 5,009,778, Cl. 210-198.200.

Niebylski, Leonard M., to Ethyl Corporation. Preceramic compositions and ceramic products. 5,009,961, Cl. 428-446.000.

Niederstaetter, Walter: *See—*
Sprintschnik, Gerhard; Niederstaetter, Walter; Reiss, Kurt; von Asten, Wolfgang; Scharf, Gunther; and Grzembra, Barbara, 5,009,722, Cl. 148-2.000.

Nielsen, Erik B.: *See—*
Gronwald, Frederik; Andersen, Peter H.; Faarup, Peter; Guddal, Erling; Hansen, Kristian T.; Hansen, Louis B.; and Nielsen, Erik B., 5,010,074, Cl. 514-213.000.

Nielsen, Kenneth A., to Union Carbide Chemicals and Plastics Technology Corporation. Methods and apparatus for obtaining wider sprays when spraying liquids by airless techniques. 5,009,367, Cl. 239-3.000.

Nielsen, Mogens C.: *See—*
Braestrup, Claus T.; Nielsen, Mogens C.; Christensen, Joergen A.; Engelstoft, Mogens; Schou, Henning; Eder, Ulrich; Neef, Gunter; Huth, Andreas; Rahtz, Dieter; and Schmiechen, Ralph, 5,010,077, Cl. 514-228.800.

Nieuwstad, Peter P. Endotracheal tube holder. 5,009,227, Cl. 128-207.170.

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Cullen, John S.; Incorvia, Samuel A.; Nigon, Christopher S.; and Vaylen, Nicholas E., 5,009,308, Cl. 206-204.000.

Nigrelli Systems, Inc.: *See—*
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Nikkoshi Co., Ltd.: *See—*
Nishizawa, Hidekazu; and Utsunomiya, Tomoaki, 5,010,299, Cl. 324-209.000.

Nikon Corporation: *See—*
Miyamoto, Hidenori, 5,010,358, Cl. 354-402.000.
Ohkuma, Hiroya; and Sanada, Satoru, 5,010,537, Cl. 369-44.320.
Suganuma, Ryoichi, 5,010,222, Cl. 318-116.000.
Uemura, Tsunesaburo, 5,010,230, Cl. 219-121.620.

Nilssen, Ole K. Power-line-operated high frequency power supply. 5,010,468, Cl. 363-37.000.

Nilsson, Arild: *See—*
Pettersen, Jarl M.; Nilsson, Arild; and Millaway, Robert M., 5,009,792, Cl. 210-705.000.

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Ninomiya, Toshio: *See—*
Okumoto, Takaharu; Ninomiya, Toshio; and Hayashi, Tstsuya, 5,009,425, Cl. 273-167.00R.

Nippe, Burkhard: *See—*
Grigat, Ernst; Meckel, Walter; and Nippe, Burkhard, 5,009,925, Cl. 427-48.000.

Nippon Densan Corporation: *See—*
Endo, Mineyo; Takegami, Kiyoyoshi; Hishida, Noriaki; and Miyaji, Itsuo, 5,009,436, Cl. 277-80.000.

Nippon Flute Co., Ltd.: *See—*
Yanai, Takeo, 5,009,740, Cl. 156-353.000.

Nippon Kokan Kabushiki Kaisha: *See—*
Higuchi, Nariyoshi; Yamagishi, Miki; and Miyachi, Tsuneharu, 5,009,871, Cl. 423-240.000.

Nippon Nyukazai Company, Ltd.: *See—*
Sakuta, Masaharu; Urano, Toshiharu; Tanaka, Kyoichi; Sugiyama, Masashi; Endoh, Shyuzo; and Fujioka, Keisuke, 5,009,713, Cl. 106-727.000.

Nippon Paint Co. Ltd.: *See—*
Yamanaka, Masahiko; Hanaoka, Motoyoshi; Konse, Hiroaki; Shigeno, Haruhisa; and Kinoshita, Masakatsu, 5,009,936, Cl. 427-407.100.
Yamasoe, Katsuyoshi, 5,009,962, Cl. 428-470.000.

Nippon Piston Ring Co. Ltd.: *See—*
Hiraoka, Takeshi; Takeguchi, Shunsuke; and Kawai, Satoshi, 5,009,123, Cl. 74-567.000.

Nippon Seiko Kabushiki Kaisha: *See—*
Matsumoto, Sakae; and Ichikawa, Mitsuo, 5,009,121, Cl. 74-493.000.
Ono, Katsuyasu, 5,009,453, Cl. 280-804.000.

Takajo, Toshimi; Asai, Hiromitsu; and Haginuma, Kiyoshi, 5,009,520, Cl. 384-100.000.
Nippon Seimitsu Kogyo Kabushiki Kaisha: *See*—
Hasegawa, Takanori; Abe, Nobuyuki; Hibara, Toru; Hirose, Toshihiko; Kanda, Takashi; Saito, Hiroshi; Oshima, Masaki; and Nakazawa, Eiji, 5,010,420, Cl. 358-471.000.
Nippon Sheet Glass Co., Ltd.: *See*—
Koyama, Akihiro; Kitamura, Keiji; and Yamamoto, Nobuyuki, 5,010,041, Cl. 501-4.000.
Nippon Steel Corporation: *See*—
Sakamoto, Hiroaki; Fujikura, Masahiro; and Mukai, Toshio, 5,009,706, Cl. 75-244.000.
Nippon Telegraph and Telephone Corporation: *See*—
Sasaki, Hiroyuki; Shimamura, Masato; Noda, Juichi; Hanafusa, Hiroaki; and Takeuchi, Yoshiaki, 5,009,478, Cl. 350-96.150.
Nippondenso Co., Ltd.: *See*—
Masaki, Shouichi; Fukushima, Akira; Fujimoto, Shusaku; and Nakano, Makoto, 5,010,489, Cl. 364-426.020.
Nishida, Masami: *See*—
Kouno, Tomomitsu; Hatano, Hideki; Yamaji, Takashi; Ootaki, Sakashi; and Nishida, Masami, 5,009,490, Cl. 350-342.000.
Murakami, Tokumichi; Asai, Kohtaro; Kamizawa, Koh; Nishida, Masami; Yamazaki, Eizo; Itoh, Atsushi; and Kinjoh, Naoto, 5,010,401, Cl. 358-136.000.
Nishikawa, Akira, to Seiko Instruments Inc. Diamond probe and forming method thereof. 5,010,249, Cl. 250-306.000.
Nishikawa, Tadashi: *See*—
Harada, Kinji; Ikeda, Kyoichi; Kuwayama, Hideki; Kobayashi, Takashi; Nishikawa, Tadashi; Watanabe, Tetsuya; and Yoshida, Takashi, 5,009,108, Cl. 73-704.000.
Nishimoto, Akihiko; Hosoya, Yoshihiro; Tomita, Kunikazu; Urabe, Toshiaki; and Jitsukawa, Masaharu, to NKK Corporation. Method of making non-oriented silicon steel sheets having excellent magnetic properties. 5,009,726, Cl. 148-111.000.
Nishimura, Eiichi; Nakamura, Takao; and Ishida, Hisaki, to Oki Electric Industry Co., Ltd. Multiplying unit circuit. 5,010,510, Cl. 364-758.000.
Nishimura, Kohsuke; and Sakai, Kazuo, to Kokusai Denshin Denwa Co., Ltd. Light emitting heterojunction semiconductor device. 5,010,376, Cl. 357-17.000.
Nishino, Masakazu, to Matsushita Electric Industrial Co., Ltd. Video signal compression apparatus. 5,010,402, Cl. 358-138.000.
Nishino, Masashi: *See*—
Okada, Kenichi; Nishino, Masashi; and Tanigawa, Shu, 5,009,480, Cl. 350-96.150.
Nishitani, Masami; and Suetomi, Joji, to Central Glass Company, Ltd. Method for heat treatment of glass plate to strengthen its peripheral region. 5,009,694, Cl. 65-115.000.
Nishiwaki, Toshihiro, to Obara Corporation. Tool changer for welding robot. 5,010,228, Cl. 219-86.250.
Nishiyama, Toshikazu: *See*—
Shinohara, Tadashi; Nishiyama, Toshikazu; Noguchi, Kazumi; Iwata, Hitoshi; and Suwabe, Shigekazu, 5,010,431, Cl. 360-103.000.
Nishiyama, Yoshinori: *See*—
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Nishizawa, Hidekazu; and Utsunomiya, Tomoaki, to Nikkoshi Co., Ltd. Method for measuring stress on steel by determining the reverse magnetic permeability under a magnetic bias field. 5,010,299, Cl. 324-209.000.
Nishizawa, Hideyuki. Apparatus for washing narrow neck bottles. 5,009,241, Cl. 134-102.000.
Nissan Motor Co., Ltd.: *See*—
Hosotani, Takashi; and Inoue, Kiyoshi, 5,009,562, Cl. 414-440.000.
Matsuda, Toshiro, 5,009,279, Cl. 180-197.000.
Mizuno, Tsuyoshi; and Hirano, Motoki, 5,010,349, Cl. 343-700.0MS.
Nakagawa, Toyoaki; Sanbuichi, Hiroshi; Terasaka, Katsunori; and Saito, Makoto, 5,009,210, Cl. 123-489.000.
Sato, Shigeki, 5,009,402, Cl. 267-140.100.
Yamaguchi, Hiroshi, 5,010,318, Cl. 340-439.000.
Yamanaka, Masahiko; Hanaoka, Motoyoshi; Konse, Hiroaki; Shigeno, Haruhisa; and Kinoshita, Masakatsu, 5,009,936, Cl. 427-407.100.
Nissborg, Kurt, to Forsvarets Forskningsanstalt. Method to detect radiation and measure its angle of incidence and a detector arrangement to carry out the method. 5,010,244, Cl. 250-206.100.
Nissim, Yosi. Check destripper. 5,009,139, Cl. 83-419.000.
Nissin Electric Co., Ltd.: *See*—
Ogata, Kiyoshi; Ando, Yasunori; and Kamijo, Eiji, 5,009,923, Cl. 427-38.000.
Nitto Chemical Industry Company, Ltd.: *See*—
Nakamura, Tomio; Shimizu, Shigeru; and Takeuchi, Kikuko, 5,009,811, Cl. 252-500.000.
Nitto Denko Corporation: *See*—
Ametani, Minoru; Funakoshi, Keigo; Kira, Akihiko; Matsushita, Takao; and Shirakura, Keizo, 5,009,735, Cl. 156-241.000.
Niwa, Kozo; and Motoyama, Shimesu, to Niwa, Kozo. Antioxidant composition of natural products and producing method thereof. 5,009,891, Cl. 424-195.100.
Nixon, Floyd K. Method of making a milk formulation. 5,009,912, Cl. 426-580.000.
NKG Insulators, Ltd.: *See*—
Yoshikawa, Akira; and Torikai, Setsuo, 5,009,038, Cl. 51-126.000.
NKK Corporation: *See*—
Nishimoto, Akihiko; Hosoya, Yoshihiro; Tomita, Kunikazu; Urabe, Toshiaki; and Jitsukawa, Masaharu, 5,009,726, Cl. 148-111.000.
Noda, Hidetoshi; Gocho, Makoto; Shimizu, Masayasu; Komatsu, Osamu; and Inoue, Hideaki, 5,009,707, Cl. 75-375.000.
Shima, Yoshinobu; and Kamio, Hiroshi, 5,009,863, Cl. 422-249.000.
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Noda, Juichi: *See*—
Sasaki, Hiroyuki; Shimamura, Masato; Noda, Juichi; Hanafusa, Hiroaki; and Takeuchi, Yoshiaki, 5,009,478, Cl. 350-96.150.
Noda, Yasushi: *See*—
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Noguchi, Isao: *See*—
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Noguchi, Kazumi: *See*—
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Noji, Minoru: *See*—
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Nolan, John H.; and Skvarce, Dennis H., to Alpha Industries, Inc. Clamping apparatus for cut-off die set. 5,009,140, Cl. 83-698.000.
Nolan, Vernon E. L. Fastening means. 5,009,540, Cl. 403-405.100.
Noll, Guenter: *See*—
Kuhl, Virgil F.; and Noll, Guenter, 5,008,988, Cl. 24-510.000.
Nolting, Peter: *See*—
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Nomoto, Seiichiro: *See*—
Yamauchi, Hiroshi; Sugiyama, Isao; Saito, Isao; Nomoto, Seiichiro; Kamiya, Takashi; Machida, Yoshimasa; and Negi, Shigeto, 5,010,188, Cl. 540-222.000.
Nomura, Satoru: *See*—
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Nonnemacher, Gail S.: *See*—
Foster, Stephen I.; Stimler, Jeffrey J.; and Nonnemacher, Gail S., 5,009,953, Cl. 428-327.000.
Norita, Toshio: *See*—
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Norman, John A. T.: *See*—
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Norsk Hydro a.s.: *See*—
Pettersen, Jarl M.; Nilsson, Arild; and Millaway, Robert M., 5,009,792, Cl. 210-705.000.
North American Philips Corporation: *See*—
Brennesholtz, Matthew S., 5,009,930, Cl. 427-236.000.
Lyle, Robert L., Jr., 5,010,292, Cl. 323-274.000.
North Carolina State University: *See*—
Lord, Peter R., 5,010,494, Cl. 364-507.000.
Northern Telecom Limited: *See*—
Morrison, Shawn J., 5,009,479, Cl. 350-96.150.
Sidi, Shiraz I.; Guilbert, Paul A.; Desroches, Lise A.; and Plasse, Michel, 5,010,210, Cl. 174-34.000.
Norton Company: *See*—
Butkus, Anthony K.; and Martin, Scott D., 5,010,046, Cl. 501-117.000.
Rue, Charles V.; van de Merwe, Ronald H.; Bauer, Ralph; Pellow, Scott W.; Cottringer, Thomas E.; and Klok, Richard J., 5,009,676, Cl. 51-309.000.
Norwood, Roger D.; and Kersh, David V., III, to Texas Instruments Incorporated. Integrated circuit furnishing a segmented input circuit. 5,010,260, Cl. 307-482.100.
Noshe Engineering Limited: *See*—
Auld, John W.; Stringer, Brian F.; and Stringer, Brian F., 5,009,305, Cl. 198-395.000.
Noualhaguet, Pierre: *See*—
Laurent, Michel; Doukhan, Marc; and Noualhaguet, Pierre, 5,010,563, Cl. 378-132.000.
Nouno, Youzou: *See*—
Moriwaki, Masafumi; Sano, Shigeaki; Hatakeyama, Katsunori; Yamada, Hiroshi; and Nouno, Youzou, 5,010,213, Cl. 178-18.000.
Novikova, Svetlana A.: *See*—
Fedin, Marat A.; Kuznetsova, Tatyana A.; Lysenkov, Viktor I.; Novikova, Svetlana A.; Savchuk, Valentin A.; Sedelnikov, Anatoly I.; Shabunya, Vera P.; Udarov, Boris G.; Tikhonova, Tatyana S.; Polyakova, Nina P.; and Paklin, Sergei I., 5,010,106, Cl. 514-546.000.
Novo Nordisk A/S.: *See*—
Gronvald, Frederik C.; and Braestrup, Claus, 5,010,090, Cl. 514-326.000.

Gronwald, Frederik; Andersen, Peter H.; Faarup, Peter; Guddal, Erling; Hansen, Kristian T.; Hansen, Louis B.; and Nielsen, Erik B., 5,010,074, Cl. 514-213.000.

Nowak, William J.; Attardi, Anthony A.; and Costanza, Daniel W., to Xerox Corporation. Segmented resonator structure having a uniform response for electrophotographic imaging. 5,010,369, Cl. 355-273.000.

Nowman, William G. Method and apparatus for drilling hardplate. 5,009,553, Cl. 408-1.00R.

Nozaki, Toshio: *See—*
Watanabe, Taichi; Ogino, Hidekazu; Hirota, Hajime; Koshika, Tomohito; Moriya, Naoko; and Nozaki, Toshio, 5,009,813, Cl. 252-545.000.

NSW Corporation, Inc.: *See—*
Ptaschek, Lawrence; Bowman, James; and Ferguson, H. William, Jr., 5,009,058, Cl. 53-469.000.

NTH, Inc.: *See—*
Coleman, Darold D.; and Nesseth, Raymond P., 5,009,545, Cl. 404-100.000.

Nuez, Jean-Paul: *See—*
Boudon, Gerard; Mollier, Pierre; Nuez, Jean-Paul; Ong, Ieng; Tannhof, Pascal; and Wallart, Franck, 5,010,257, Cl. 307-446.000.

Numai, Kazuhisa: *See—*
Nakamura, Kosei; Kono, Shinichi; Numai, Kazuhisa; and Kimijima, Masami, 5,010,286, Cl. 318-571.000.

Numata, Tomiyuki: *See—*
Fuji, Hiroshi; Fujiwara, Tsuneo; Iwaki, Takashi; Numata, Tomiyuki; Tsuji, Kentaroh; Maeda, Shigemi; Yamaguchi, Takeshi; Kojima, Kunio; Deguchi, Toshihisa; and Terashima, Shigeo, 5,010,540, Cl. 369-50.000.

Nygard, John E.: *See—*
Minshall, Billy W.; Purohit, Kailash; Nygard, John E.; Sintim-Damoa, Kwame; Giesler, Richard; and Woodworth, Archie, 5,009,654, Cl. 604-410.000.

Nys, Pierre H.; Vinck, Paul W.; and von Erdmannsdorff, Andreas, to Agfa-Gevaert, N.V. Method for colour correction by dry dot etching using photographically produced mask. 5,010,398, Cl. 358-80.000.

Oates, Martin, to Texas Instruments Incorporated. Content addressable memory. 5,010,516, Cl. 365-49.000.

Obara Corporation: *See—*
Nishiwaki, Toshihiro, 5,010,228, Cl. 219-86.250.

Obase, Hiroyuki: *See—*
Oshima, Etsuo; Obase, Hiroyuki; Karasawa, Akira; Kubo, Kazuhiro; Miki, Ichiro; and Ishii, Akio, 5,010,087, Cl. 514-307.000.
Oshima, Etsuo; Obase, Hiroyuki; Karasawa, Akira; Kubo, Kazuhiro; Miki, Ichiro; and Ishii, Akio, 5,010,104, Cl. 514-510.000.

Obata, Keiichi: *See—*
Saitoh, Masahiro; Yoshida, Suguru; Obata, Keiichi; and Ono, Yoshinobu, 5,009,463, Cl. 296-210.000.

Oberdorfer, Hans, to Hansa Metallwerke AG. Pipe interrupter. 5,009,247, Cl. 137-218.000.

Obitz, Daniel: *See—*
Manoury, Philippe; Binet, Jean; Obitz, Daniel; Defosse, Gerard; Dewitte, Elisabeth; and Veronique, Corinne, 5,010,079, Cl. 514-253.000.

O'Brien, John F., to Xerox Corporation. Magnetic transport roll for supplying toner or carrier and toner to a donor and magnetic developer roll respectively. 5,010,368, Cl. 355-259.000.

O'Brien, Michael J.: *See—*
Desorcie, James L.; and O'Brien, Michael J., 5,010,118, Cl. 522-31.000.

Oce Nederland B.V.: *See—*
Linssen, Johannes L. J. M.; and Pleyers, Jozef J. A., 5,010,373, Cl. 355-319.000.

Ochiai, Kuniaki: *See—*
Horii, Masami; Komakine, Shigeo; Ochiai, Kuniaki; and Kondoh, Takashi, 5,009,528, Cl. 400-124.000.

Ochs, Charles S., to Anchor Hocking Corporation. Closure having thermally responsive water washing slots. 5,009,324, Cl. 215-276.000.

O'Connor, James T.; and Courtright, David A., to SGS-Thomson Microelectronics, Inc. System for synchronizing data frames in a serial bit stream. 5,010,559, Cl. 375-116.000.

Oculus Optikgeraete GmbH: *See—*
Reiner, Josef, 5,009,487, Cl. 350-286.000.

Oda, Takao: *See—*
Hokuyo, Shigeru; Oda, Takao; and Matsumoto, Hideo, 5,009,720, Cl. 136-255.000.

Odahara, Kazuhiro: *See—*
Tanaka, Takao; and Odahara, Kazuhiro, 5,010,265, Cl. 310-88.000.

Odashima, Tohru: *See—*
Higuchi, Shigetaka; Noguchi, Isao; and Odashima, Tohru, 5,008,998, Cl. 29-840.000.

Oftring, Alfred: *See—*
Perner, Johannes; Diessel, Paul; Hartmann, Heinrich; Denzinger, Walter; Oftring, Alfred; and Schoenleben, Willibald, 5,009,805, Cl. 252-174.240.

Ogata, Kiyoshi; Ando, Yasunori; and Kamijo, Eiji, to Nissin Electric Co., Ltd. Method of forming diamond film. 5,009,923, Cl. 427-38.000.

Ogawa, Ikuzo, to Kabushiki Kaisha Maruzen Shokuhin. Method for preparing konjak chip. 5,009,915, Cl. 426-615.000.

Ogawa, Kyosuke: *See—*
Honda, Mitsuru; Koike, Atsushi; Kimura, Tomohiro; Ogawa, Kyosuke; and Murai, Keiichi, 5,009,974, Cl. 430-69.000.

Ogawa, Sumitaka: *See—*
Kushida, Kazumitsu; Kudou, Osamu; Ogawa, Sumitaka; and Uike, Hiroshi, 5,009,211, Cl. 123-491.000.

Ogino, Hidekazu: *See—*
Watanabe, Taichi; Ogino, Hidekazu; Hirota, Hajime; Koshika, Tomohito; Moriya, Naoko; and Nozaki, Toshio, 5,009,813, Cl. 252-545.000.

Ogino, Masanori; Yamada, Takeo; and Ikeda, Miyuki, to Hitachi, Ltd. Vertical deflection circuit for CRT display device. 5,010,280, Cl. 315-388.000.

Ohashi, Kunio: *See—*
Hayakawa, Takeshi; Narikawa, Shiro; Ohashi, Kunio; and Tsujimoto, Yoshiharu, 5,009,977, Cl. 430-84.000.

Ohba, Noriko: *See—*
Wakita, Naohide; Uemura, Tsuyoshi; Ohnishi, Hiroyuki; Ohba, Noriko; Ota, Isao; and Fujita, Shingo, 5,010,327, Cl. 340-784.000.

Ohio Associated Enterprises, Inc.: *See—*
Black, Robert H.; and Venaleck, John T., 5,009,618, Cl. 439-736.000.

Ohio State University Research Foundation: *See—*
Minton, John P.; Webb, Thomas E.; and Abou-Issa, Hussein M., 5,010,107, Cl. 514-578.000.

Ohio University: *See—*
Collier, John R.; and Collier, Billie J., 5,009,954, Cl. 428-400.000.

Ohkawa, Osamu; Tamahoko, Tetsuya; and Imanage, Eisuke, to Tokyo Seat Co., Ltd. Power transmitting apparatus for use in vehicle. 5,009,296, Cl. 192-20.000.

Ohkoshi, Seizi; and Kuwahara, Eiji, to Kabushiki Kaisha Toshiba. Multi-system air conditioning machine. 5,009,078, Cl. 62-160.000.

Ohkuma, Hiroya; and Sanada, Satoru, to Nikon Corporation. Optical disc device with multi-head slider and tracking control. 5,010,537, Cl. 369-44.320.

Ohkuni, Masato: *See—*
Kasahara, Nobuo; Watanuki, Masayoshi; Maeno, Satoru; and Ohkuni, Masato, 5,010,372, Cl. 355-313.000.

Ohmae, Tadayuki; Sakurai, Tadashi; and Asao, Kouichiro, to Sumitomo Chemical Co., Ltd. Conjugate fibers and nonwoven molding thereof. 5,009,951, Cl. 428-294.000.

Ohmae, Tadayuki; Toyoshima, Yoshiki; Mashita, Kentaro; Yamaguchi, Noboru; and Nambu, Jinsho, to Sumitomo Chemical Company, Limited. Process for producing impact-resistant polyamide resin compositions. 5,010,136, Cl. 525-66.000.

Ohmamyuda, Yukio; Tanabe, Toru; Matsumoto, Osamu; Suzuki, Hidenobu; and Jyouzuka, Masashi, to Stanley Electric Co., Ltd. Apparatus for adjusting attitude of optical axes of head lamps on vehicle. 5,010,457, Cl. 362-66.000.

Ohmi, Tadahiro; Miki, Masahiro; Kikuyama, Hirohisa; and Maeno, Matagoro. Metal material with film passivated by fluorination and apparatus composed of the metal material. 5,009,963, Cl. 428-472.200.

Ohmori, Kenji: *See—*
Suzuki, Fumio; Kuroda, Takeshi; Nakasato, Yoshisuke; Ohmori, Kenji; and Manabe, Haruhiko, 5,010,084, Cl. 514-293.000.

Ohms, Jack I.: *See—*
Zare, Richard N.; Huang, Xiaohua; and Ohms, Jack I., 5,009,760, Cl. 204-183.300.

Ohnishi, Hiroyuki: *See—*
Wakita, Naohide; Uemura, Tsuyoshi; Ohnishi, Hiroyuki; Ohba, Noriko; Ota, Isao; and Fujita, Shingo, 5,010,327, Cl. 340-784.000.

Ohshita, Saiichiro; and Fukamachi, Kazuhiro, to Fuji Jukogyo Kabushiki Kaisha. Bear-wheel control method for a motor vehicle with a four-wheel steering system. 5,010,488, Cl. 364-424.050.

Ohtomi, Koichi: *See—*
Shioyama, Tsutomu; Minakami, Ko; Fujii, Takao; and Ohtomi, Koichi, 5,009,838, Cl. 376-310.000.

Ohtsuki, Shigeo; and Tanaka, Motonao. Doppler flow velocity distribution measuring apparatus. 5,010,528, Cl. 367-90.000.

Ohzeki, Yukihiro: *See—*
Araya, Junji; Ohzeki, Yukihiro; Miyamoto, Toshio; Hiroshima, Koichi; Sato, Yasushi; and Nakahata, Kimio, 5,010,370, Cl. 355-274.000.

Oilar, Clayton D. Combination writing implement and toothpick dispenser. 5,009,535, Cl. 401-195.000.

Oishi, Kayoko: *See—*
Maeno, Yoshinori; Kobayashi, Masanobu; and Oishi, Kayoko, 5,009,762, Cl. 204-192.160.

Okada, Kazuhisa; and Kusumoto, Ichirou, to Mitsubishi Denki Kabushiki Kaisha. Wafer prober. 5,010,296, Cl. 324-158.00P.

Okada, Kenichi; Nishino, Masashi; and Tanigawa, Shu, to Japan Aviation Electronics Industry Limited. Fiber optic gyro. 5,009,480, Cl. 350-96.150.

Okada, Kenji; and Ueno, Hiroshi, to Mazda Motor Manufacturing (USA) Corp. Closed noncontinuous electrodeposition painting system. 5,009,758, Cl. 204-180.800.

Okazaki, Hiroshi: *See—*
Matsushita, Nobutaka; Okazaki, Hiroshi; Yamanouchi, Shosuke; Osawa, Yoshitaka; and Tsujigaito, Isao, 5,009,959, Cl. 428-419.000.

Oki Electric Industry Co., Ltd.: *See—*
Fukuda, Hisashi, 5,009,926, Cl. 427-55.000.
Maeno, Yoshinori; Kobayashi, Masanobu; and Oishi, Kayoko, 5,009,762, Cl. 204-192.160.
Nishimura, Eiichi; Nakamura, Takao; and Ishida, Hisaki, 5,010,510, Cl. 364-758.000.
Takeda, Takayuki; and Satoh, Masayasu, 5,010,538, Cl. 369-44.360.

Okita, Junichi: *See—*
Abe, Ryoji; Okita, Junichi; Miyagoshi, Katsunobu; and Hashiyama, Kouichi, 5,009,205, Cl. 123-195.00H.

Oklahoma Medical Research Foundation: *See—*
Taylor, Fletcher B., Jr.; and Esmon, Charles T., 5,009,889, Cl. 424-94.640.

Okoren, Ronald W., to American Standard Inc. Fault determination test method for systems including an electronic expansion valve and electronic controller. 5,009,075, Cl. 62-127.000.

Okoshi, Seiji; and Kuwahara, Eiji, to Kabushiki Kaisha Toshiba. Multi-system air conditioner. 5,009,077, Cl. 62-160.000.

Okuda, Hiroshi; and Ozawa, Masayuki, to Mitsubishi Denki Kabushiki Kaisha. Ignition timing control circuit for an internal combustion engine. 5,009,209, Cl. 123-415.000.

Okuda, Tamotsu: *See—*
Sudo, Masamichi; and Okuda, Tamotsu, 5,009,646, Cl. 604-230.000.

Okuda, Yasuji: *See—*
Inoue, Hiroshi; Yokono, Wataru; and Okuda, Yasuji, 5,009,536, Cl. 401-198.000.

Okumoto, Takaharu; Hayashida, Tadashi; Kawada, Kazuo; and Hayashi, Tetsuo, to Yokohama Rubber Co., Ltd., The. Wood golf club and its production method. 5,009,423, Cl. 273-80.200.

Okumoto, Takaharu; Ninomiya, Toshio; and Hayashi, Tstsuya, to Yokohama Rubber Co., Ltd., The. Golf club head. 5,009,425, Cl. 273-167.00R.

Old, Lloyd: *See—*
Albino, Anthony; Lloyd, Kenneth; Ikeda, Hisami; and Old, Lloyd, 5,009,995, Cl. 435-7.230.

Olding, Michael. Chimney crown mold. 5,009,047, Cl. 52-218.000.

O'Lenick, Anthony J., Jr.; Miller, John C.; and Clumpner, J. Michael, to LCE Partnership. Free radical stabilized alkoxylates. 5,010,173, Cl. 528-408.000.

Olin Corporation: *See—*
Bilsbury, Stephen J.; Dennis, William G., Jr.; and Kernosky, Stephen K., 5,009,166, Cl. 102-516.000.
Rothgery, Eugene F., 5,009,700, Cl. 71-94.000.

Olin Hunt Specialty Products Inc.: *See—*
Buxton, Galina P.; and Tang, Kuo-Chang, 5,009,979, Cl. 430-110.000.

Oliver, Thomas C.: *See—*
Wanger, Mark E.; Methlie, Jennifer L.; Christie, Leslie G.; Dauner, Daniel R.; Domel, Douglas R.; Jones, David P.; Oliver, Thomas C.; and Stavely, Donald J., 5,010,536, Cl. 369-36.000.

Oliveri, Andrew L.: *See—*
Beattie, Patrick J.; Oliveri, Andrew L.; and Sylvester, Richard J., 5,009,090, Cl. 70-326.000.

Olson, Gene L.: *See—*
Lawrence, Lowell J.; Ruzo, Luis O.; and Olson, Gene L., 5,009,112, Cl. 73-866.000.

Olsson, Lars-Inge R.; and Hamacek, Kent F., to Perstorp AB. Flowability improving agent, process for the production thereof and use thereof. 5,010,124, Cl. 524-141.000.

Olympus Optical Company Ltd.: *See—*
Maitani, Yoshihisa, 5,010,359, Cl. 354-410.000.
Tsuji, Kiyoshi; and Kimura, Kenji, 5,010,395, Cl. 358-44.000.

Omoda, Koichiro; Tanaka, Teruo; Nakagoshi, Junji; Hamanaka, Naoki; and Nagashima, Shigeo, to Hitachi, Ltd. Method and apparatus for transferring vector data between parallel processing system with registers & logic for inter-processor data communication independents of processing operations. 5,010,477, Cl. 364-200.000.

Omron Tateisi Electronics Co.: *See—*
Imanaka, Koichi; and Imamoto, Hiroshi, 5,010,556, Cl. 372-46.000.
Mita, Katsuya, 5,010,239, Cl. 235-441.000.

Ong, Ieng: *See—*
Boudon, Gerard; Mollier, Pierre; Nuez, Jean-Paul; Ong, Ieng; Tannhof, Pascal; and Wallart, Franck, 5,010,257, Cl. 307-446.000.

Ono, Katsuyasu, to Nippon Seiko Kabushiki Kaisha. Webbing guiding structure for automobile seat belt system. 5,009,453, Cl. 280-804.000.

Ono, Yoshinobu: *See—*
Saitoh, Masahiro; Yoshida, Suguru; Obata, Keiichi; and Ono, Yoshinobu, 5,009,463, Cl. 296-210.000.

Onodera, Tsutomu; and Yamada, Takeshi, to Fujikura Ltd. Method of measuring quantity of heat applied to optical fiber. 5,009,513, Cl. 374-31.000.

Ookuma, Ikuo: *See—*
Sasaki, Yoshiyuki; Tsunashima, Kenji; Ookuma, Ikuo; and Fujii, Toshifumi, 5,010,404, Cl. 358-139.000.

Ootaki, Sakashi: *See—*
Kouno, Tomomitsu; Hatano, Hideki; Yamaji, Takashi; Ootaki, Sakashi; and Nishida, Masami, 5,009,490, Cl. 350-342.000.

Oppenlaender, Knut: *See—*
Martischius, Franz-Dieter; Vogel, Hans-Henning; Greif, Norbert; Oppenlaender, Knut; Denzinger, Walter; and Hartmann, Heinrich, 5,009,670, Cl. 44-385.000.

Ordo, James P.; Raszkowski, James A.; and Klemen, Donald, to General Motors Corporation. Power transmission. 5,009,116, Cl. 74-331.000.

Ordo, James P.; and Latshaw, Harry E., to General Motors Corporation. Countershaft power transmission with dowel pin and seal ring structure. 5,009,117, Cl. 74-331.000.

Oremland, Ronald S., to United States of America, Interior. Selenate removal from waste water. 5,009,786, Cl. 210-602.000.

Osawa, Yoshitaka: *See—*
Matsushita, Nobutaka; Okazaki, Hiroshi; Yamanouchi, Shosuke; Osawa, Yoshitaka; and Tsujigaito, Isao, 5,009,959, Cl. 428-419.000.

Osborn, Carl F. Dental mouth prop. 5,009,595, Cl. 433-140.000.

Osborn, Thomas W., III, to Procter & Gamble Company, The. Thin, flexible sanitary napkin. 5,009,653, Cl. 604-385.100.

Oshima, Etsuo; Obase, Hiroyuki; Karasawa, Akira; Kubo, Kazuhiro; Miki, Ichiro; and Ishii, Akio, to Kyowa Hakko Kogyo Co., Ltd. Tricyclic compounds and TXA_2 antagonistic compositions thereof. 5,010,087, Cl. 514-307.000.

Oshima, Etsuo; Obase, Hiroyuki; Karasawa, Akira; Kubo, Kazuhiro; Miki, Ichiro; and Ishii, Akio, to Kyowa Hakko Kogyo Co., Ltd. Tricyclic compounds. 5,010,104, Cl. 514-510.000.

Oshima, Masaki: *See—*
Hasegawa, Takanori; Abe, Nobuyuki; Hibara, Toru; Hirose, Toshihiko; Kanda, Takashi; Saito, Hiroshi; Oshima, Masaki; and Nakazawa, Eiji, 5,010,420, Cl. 358-471.000.

Oshima, Shinji; and Misawa, Hidenobu, to NGK Insulators, Ltd. Closed end sleeve producing method and core structure used in the method. 5,009,832, Cl. 264-571.000.

Osmose Wood Preserving, Inc.: *See—*
Leach, Robert M.; and Richards, Michael J., 5,009,964, Cl. 428-526.000.

Ostic, Ernest L.: *See—*
Spehar, Eli G., 5,009,170, Cl. 108-36.000.

Ostlund, Olov: *See—*
Lager, Kjell; Tarnstrom, Anders; Ostlund, Olov; and Driver, Joseph W., 5,009,039, Cl. 51-165.770.

Ostrand, James C., to General Motors Corporation. Rotary air valve. 5,009,392, Cl. 251-180.000.

Ota, Isao: *See—*
Wakita, Naohide; Uemura, Tsuyoshi; Ohnishi, Hiroyuki; Ohba, Noriko; Ota, Isao; and Fujita, Shingo, 5,010,327, Cl. 340-784.000.

Otis Elevator Company: *See—*
Nakai, Keiichiro; and Nakanishi, Yoshinori, 5,009,288, Cl. 187-20.000.
Sansevero, Frank M., 5,009,302, Cl. 198-328.000.

Oto, Hideki, to Kabushiki Kaisha Toshiba. Television tuner for receiving multiple band television signals. 5,010,400, Cl. 358-86.000.

Otokawa, Mitsuhiro: *See—*
Hasegawa, Masahide; Otokawa, Mitsuhiro; Matsuoka, Hidetoshi; and Hirata, Noritsugu, 5,010,424, Cl. 360-77.140.

Otsuki, Hajime; Kusano, Hideaki; and Kato, Osami, to Minolta Camera Kabushiki Kaisha. Image projecting system. 5,010,362, Cl. 355-74.000.

Ott, Gerhard, to Dr. Ing. h.c.F. Porsche AG. Active spring-and-damper system. 5,009,400, Cl. 267-64.110.

Ott, Karl-Heinz: *See—*
Eckel, Thomas; Leitz, Edgar; Wittmann, Dieter; Ott, Karl-Heinz; Peters, Horst; and Schoeps, Jochen, 5,010,135, Cl. 525-63.000.

Outboard Marine Corporation: *See—*
Meier, Peter W., 5,009,619, Cl. 440-53.000.

Outokumpu Oy: *See—*
Heimala, Seppo O.; Hyvarinen, Olli V. J.; and Metsarinta, Maija-Leena, 5,009,870, Cl. 423-239.000.

Oven, Tordis B.: *See—*
Gautvik, Kaare M.; Alestrom, Peter; Oven, Tordis B.; and Gabrielsen, Odd S., 5,010,010, Cl. 435-252.300.

Overman, Gregg: *See—*
West, Michael H.; and Overman, Gregg, 5,009,937, Cl. 427-440.000.

Owen, Hartley: *See—*
Harandi, Mohsen N.; and Owen, Hartley, 5,009,859, Cl. 422-189.000.

Owens-Corning Fiberglas Corporation: *See—*
Klett, Paul A.; Bakhshi, Shiv K.; and Stahl, Steven B., 5,009,932, Cl. 427-243.000.
Pollet, Jean-Claude; Williams, Gary L.; Armstrong, Gordon P.; and Miller, David G., 5,009,941, Cl. 428-36.300.

Owens, Mark J.: *See—*
Gordon, Herman B.; Owens, Mark J.; Rubinstein, Leon; and Simpson, Scott, 5,009,607, Cl. 439-67.000.

Oy Alko AB: *See—*
Palva, Ilkka, 5,010,000, Cl. 435-69.100.
Palva, Ilkka, 5,010,015, Cl. 435-320.000.

Oy Tampella AB: *See—*
Lehto, Jorma, 5,009,736, Cl. 156-250.000.

Oyama, Nobuaki: *See—*
Akizawa, Nobuyuki; Kudo, Yasunori; Kanai, Toshiyuki; Kamei, Yasuo; Oyama, Nobuaki; and Negishi, Akihito, 5,009,355, Cl. 227-114.000.

Oyama, Takuji: *See—*
Harano, Takeshi; Takaki, Satoru; Shigesato, Yuzo; Suzuki, Koichi; Hashimoto, Naoki; Kojima, Hiroyasu; and Oyama, Takuji, 5,009,922, Cl. 427-37.000.

Ozaki, Yukio: *See—*
Hanyu, Masaaki; and Ozaki, Yukio, 5,010,396, Cl. 358-60.000.

Ozawa, Masayuki: *See—*
Okuda, Hiroshi; and Ozawa, Masayuki, 5,009,209, Cl. 123-415.000.

Ozone, Toshio: *See—*
Sugimoto, Atsushi; Nakano, Osamu; Yasuda, Shigeru; Maeda, Chikatoshi; Ozone, Toshio; and Kawagoe, Makoto, 5,009,843, Cl. 420-112.000.

Pacesetter Infusion, Ltd.: *See—*
Gorton, Lanny A., 5,009,641, Cl. 604-131.000.

Padget, John C.: *See—*
Yeates, Steven G.; and Padget, John C., 5,010,121, Cl. 523-336.000.

Paersch, Michael J.: *See—*
Franke, Friedrich H.; and Paersch, Michael J., 5,009,671, Cl. 44-598.000.

Paetz, Klaus-Christian: *See*—
Serini, Volker; Freitag, Dieter; Westeppe, Uwe; Idel, Karsten; Grigo, Ulrich; Casser, Carl; Paetz, Klaus-Christian; and Hajek, Manfred, 5,010,162, Cl. 528-196.000.
Serini, Volker; Freitag, Dieter; Westeppe, Uwe; Idel, Karsten; Grigo, Ulrich; Casser, Carl; Paetz, Klaus-Christian; and Hajek, Manfred, 5,010,163, Cl. 528-196.000.

Pajgrt, Jan; Smetak, Vincenc; Kalina, Jaroslav; Zemek, Michal; Pus, Milan; and Bucek, Pavel, to ZVS Vyzkumnevyvojovy ustav. Device for removing a thread, with rotatable ring and rotatable boom for clamping an end of the thread. 5,009,253, Cl. 139-116.200.

Paklin, Sergei I.: *See*—
Fedin, Marat A.; Kuznetsova, Tatyana A.; Lysenkov, Viktor I.; Novikova, Svetlana A.; Savchuk, Valentin A.; Sedelnikov, Anatoly I.; Shabunya, Vera P.; Udarov, Boris G.; Tikhonova, Tatyana S.; Polyakova, Nina P.; and Paklin, Sergei I., 5,010,106, Cl. 514-546.000.

Palara, Sergio: *See*—
Zisa, Michele; and Palara, Sergio, 5,010,439, Cl. 361-91.000.

Paley, Martyn N. J.; Murdoch, James B.; Lampman, David A.; and McNally, James M., to Picker International, Inc. Multi-axis pre-saturated spin echo phase encoded spectroscopy. 5,010,300, Cl. 324-309.000.

Palfreyman, Michael G.; Wiech, Norbert L.; Cheng, Hsien C.; and Kane, John M., to Merrell Dow Pharmaceuticals Inc. Lactamimides as calcium antagonists. 5,010,072, Cl. 514-183.000.

Pallmann Maschinenfabrik GmbH & Co. KG: *See*—
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Cederholm, Roger; and Plude, Christopher J., 5,009,749, Cl. 162-271.000.

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Pulskamp, Nicholas R. Continuous feed board inserter. 5,009,408, Cl. 270-57.000.

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Koski, Greg, 5,010,122, Cl. 524-80.000.

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Petit, Laurent; Bournonville, Jean-Paul; Guth, Jean-Louis; Raatz, Francis; and Seive, Alain, 5,010,048, Cl. 502-61.000.

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Keil, Michael; Schirmer, Ulrich; Kast, Juergen; Kolassa, Dieter; Wuerzer, Bruno; Meyer, Norbert; Rademacher, Wilhelm; Jung, Johann; and Carlson, Dale R., 5,009,702, Cl. 71-100.000.

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Radkowski, Stanley J. Match head composition and method of making same. 5,009,729, Cl. 149-109.400.

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Storrow, Alan J.; and Knighton, Nigel J., 5,010,444, Cl. 361-386.000.

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Braestrup, Claus T.; Nielsen, Mogens C.; Christensen, Joergen A.; Engelstoft, Mogens; Schou, Henning; Eder, Ulrich; Neef, Gunter; Huth, Andreas; Rahtz, Dieter; and Schmiechen, Ralph, 5,010,077, Cl. 514-228.800.

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Cherukuri, Subraman R.; Raman, Krishna; Mansukhani, Gul; Cifrese, Ralph; and Wong, Lucy L., 5,009,893, Cl. 424-440.000.

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Ramsey, E. Don. Combination backpack and tree stand. 5,009,285, Cl. 182-187.000.

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Ring, Gregg, Sr.; and Soper, Daniel C., 5,009,573, Cl. 417-53.000.

Rasmussen, James M., to Cummins-Allison Corp. Coin sorting mechanism. 5,009,627, Cl. 453-10.000.

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Wagner, Joachim; Peltzer, Karl; and Rasshofer, Werner, 5,009,950, Cl. 428-290.000.

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Torborg, John G., Jr., 5,010,515, Cl. 364-900.000.

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Ordo, James P.; Raszkowski, James A.; and Klemen, Donald, 5,009,116, Cl. 74-331.000.

Raubenheimer, Hans-Juergen: *See—*
Hennig, Karl; Hartmann, Heinrich; and Raubenheimer, Hans-Juergen, 5,010,150, Cl. 526-88.000.

Rautaruukki Oy: *See—*
Maenpaa, Matti; Lehtoluoma, Teuvo; Henttinen, Kauko; Jokipalo, Pertti; Saren, Aimo; and Pirinen, Seppo, 5,009,096, Cl. 72-239.000.

Raymond, Kenneth N.: *See—*
Engelstad, Barry L.; Raymond, Kenneth N.; Huberty, John P.; and White, David L., 5,010,191, Cl. 544-225.000.

Raynet Corporation: *See—*
Ellersick, William F., 5,010,293, Cl. 323-278.000.

Raytheon Company: *See—*
Greer, James A., 5,010,270, Cl. 310-313.00D.

RCA Licensing Corporation: *See—*
Maninger, Loren L.; and Marks, Bruce G., 5,010,271, Cl. 313-412.000.
Rodriguez-Cavazos, Enrique, 5,010,281, Cl. 315-411.000.

Reaves, Thomas A.; and Sherritt, John S., to Premier Industries, Inc. Insulated container system for shipping perishable products. 5,009,326, Cl. 220-441.000.

Reber, Mark A.: *See—*
Cox, Roger G.; Reber, Mark A.; and Yeager, Michael W., 5,010,509, Cl. 364-748.000.

Reddy, V. Butchi, to GTE Products Corporation. Niobium-activated yttrium tantalate x-ray phosphor with improved brightness and method of making same. 5,009,807, Cl. 252-301.40H.

Redl, Robert F., to Volpe, Louis J., Jr.; Wagner, Steven E.; and Kurpick, Daniel L. Brick line tool. 5,009,015, Cl. 33-409.000.

Reeves, Richard R. Tire breaker apparatus for all-terrain vehicle tires. 5,009,257, Cl. 157-1.260.

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Hunter, Gregory H.; Wells, Benjamin A.; and Feldstein, Michael A., 5,009,473, Cl. 350-6.600.

Regnier, Kent, to Molex Incorporated. High density electrical connector for printed circuit boards. 5,009,611, Cl. 439-326.000.

Reich, Harry; and Koch, Peter, to Richard Wolf Medical Instruments Corp. Self-retaining electrically insulative trocar sleeve and trocar. 5,009,643, Cl. 604-165.000.

Reich, Reuven: *See*—
Fuller, George C.; Martin, George R.; Mueller, Richard A.; and Reich, Reuven, 5,010,080, Cl. 514-255.000.

Reichman, Karl-Heinz; and Krumb, Heinrich W., to General Motors Corporation. Headlight support. 5,010,456, Cl. 362-61.000.

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Reid, Lee R.; and Yuan, Han-Tzong, to Texas Instruments Incorporated. Semiconductor layer with optical communication between chips disposed therein. 5,009,476, Cl. 350-96.110.

Reiher, Uwe: *See*—
Springer, Hartmut; and Reiher, Uwe, 5,010,180, Cl. 534-638.000.

Reiland, Thomas L.: *See*—
Brinker, Dale R.; and Reiland, Thomas L., 5,009,897, Cl. 424-469.000.

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Reimels, Harry G., to Mentor O&O Inc. Bipolar electrosurgical instrument. 5,009,656, Cl. 606-48.000.

Reimers, Paul P. Float controlled switch. 5,010,218, Cl. 200-84.00R.

Reiner, Josef, to Oculus Optikgeraete GmbH. Prism system for a stereoscopic microscope. 5,009,487, Cl. 350-286.000.

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Reiss, Kurt: *See*—
Sprintschnik, Gerhard; Niederstaetter, Walter; Reiss, Kurt; von Asten, Wolfgang; Scharf, Gunther; and Grzembra, Barbara, 5,009,722, Cl. 148-2.000.

Remus, Christian: *See*—
Wider, Michael; Rossio, Charles; and Remus, Christian, 5,009,801, Cl. 252-033.200.

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Bustamante, Michael R.; Renaker, John J., Jr.; and Magley, Donald A., 5,009,790, Cl. 210-689.000.

Rende, Giorgio: *See*—
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Hayashi, Yutaka; Itoh, Atuo; Imai, Mizuho; and Iida, Hideyo, 5,009,928, Cl. 427-126.300.

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Kalman, Thomas I., 5,010,103, Cl. 514-495.000.

Respironics Inc.: *See*—
Scarberry, Eugene N., 5,009,635, Cl. 604-27.000.

Rettie, C. William. Rotary cutter device. 5,009,138, Cl. 83-413.000.

Rettig, Helmut; Weiss, Karl; and Buss, Erich, to Uni-Cardan Aktiengesellschaft. Apparatus and method for fitting a protective boot particularly for articulated joint assemblies. 5,008,994, Cl. 29-235.000.

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Parmentier, Francois; and Persello, Jacques, 5,009,874, Cl. 423-335.000.
Quemere, Eric, 5,010,052, Cl. 502-304.000.

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Cros, Patrick; and Pipon, Robert, 5,010,186, Cl. 536-114.000.

Richard, Carl E.: *See*—
Viazmensky, Helen; Richard, Carl E.; and Williamson, James E., 5,009,747, Cl. 162-115.000.

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Leach, Robert M.; and Richards, Michael J., 5,009,964, Cl. 428-526.000.

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Kasahara, Nobuo; Watanuki, Masayoshi; Maeno, Satoru; and Ohkuni, Masato, 5,010,372, Cl. 355-313.000.

Riebli, Peter, to Ciba-Geigy Corporation. Pesticidal 2-hydrazinopyramidine compounds. 5,010,082, Cl. 514-272.000.

Riedweg, Robert; and Schlensog, Klaus, to Ameda AG. Breast pump. 5,009,638, Cl. 604-74.000.

Ries, Stanley K.; Wert, Violet F.; and Nair, Muraleedharan G., to Board of Trustees operating Michigan State University. Method for stimulating plant growth using synthetically produced 9-beta-l(+) adenosine. 5,009,698, Cl. 71-92.000.

Riffe, William J.; and Carter, Jack D., Jr., to Marine Environmental Research, Inc. Electrochemical system for the prevention of fouling on steel structures in seawater. 5,009,757, Cl. 204-147.000.

Riley, Thomas P., to United States of America, Navy. Magnetic coupler for electroacoustic hydrophones. 5,010,530, Cl. 367-154.000.

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Ringwood, Alfred E., to Australian National University, The. Production of diamond compacts consisting essentially of diamond crystals bonded by silicon carbide. 5,010,043, Cl. 501-90.000.

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Marutake, Yozo; Fukutome, Tatsuro; and Asami, Motomu, 5,010,575, Cl. 381-68.000.

Risa, Steinar: *See*—
Molaug, Ole; and Risa, Steinar, 5,009,908, Cl. 426-454.000.

Rishworth, Denis L.: *See*—
Rishworth, Paul L.; Rishworth, Denis L.; and Dixon, Daniel A., 5,009,612, Cl. 439-403.000.

Rishworth, Paul L.; Rishworth, Denis L.; and Dixon, Daniel A., to Molex Incorporated. Multi-conductor electrical cable connector. 5,009,612, Cl. 439-403.000.

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Hasegawa, Takanori; Abe, Nobuyuki; Hibara, Toru; Hirose, Toshihiko; Kanda, Takashi; Saito, Hiroshi; Oshima, Masaki; and Nakazawa, Eiji, 5,010,420, Cl. 358-471.000.

Rispoli, Joseph M.: *See*—
Saslaw, Irving M.; Topalian, Harry H.; and Rispoli, Joseph M., 5,009,904, Cl. 426-243.000.

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Erlendsson, Gudni; and Hjaltason, Thorgeir D., 5,009,019, Cl. 40-541.000.

Robare, Douglas F. F. Container carrier. 5,009,315, Cl. 206-427.000.

Robert Bosch GmbH: *See*—
Fedter, Horst; Grunwald, Werner; Nolting, Peter; de la Prieta, Claudio; and Schmid, Kurt, 5,010,315, Cl. 338-7.000.
Grob, Ferdinand; Kienzler, Dieter; Linder, Ernst; Potschin, Roger; and Stutzenberger, Heinz, 5,009,064, Cl. 60-276.000.
Grunwald, Werner; Holfelder, Gerhard; De La Prieta, Claudio; and Schmid, Kurt, 5,009,708, Cl. 106-105.000.

Robert Bosch Power Tool Corporation: *See*—
Martinez, David M.; and Campbell, Gordon C., 5,009,012, Cl. 30-394.000.

Roberts, David A.: *See*—
Ellison, Thomas L.; Roberts, David A.; Ivankovits, John C.; and Norman, John A. T., 5,009,725, Cl. 148-23.000.

Roberts, Jeffrey J.: *See*—
Branam, Timothy R.; Roberts, Jeffrey J.; and Schoenberger, Jack O., 5,009,101, Cl. 73-168.000.

Robertson, Martha H.: *See*—
McElrath, Kenneth O., Jr.; Robertson, Martha H.; and Chow, Wai Yan, 5,010,119, Cl. 523-205.000.

Robins, Kendall H.; Austin, Dennis K.; and Spraggs, Richard W., to Ensign-Bickford Company, The. Non-electric signal transmission device connection, method and apparatus therefor. 5,009,163, Cl. 102-301.000.

Robinson, Dennis W., to Spafax Holdings Plc. Method of producing an optical component, and components formed thereby. 5,009,761, Cl. 204-192.140.

Robinson, Irwin J., III: *See*—
Janney, Mark A.; Newey, Roger; and Robinson, Irwin J., III, 5,010,560, Cl. 377-20.000.

Robwen, Inc.: *See*—
Grindley, John R.; and Grindley, Robert M., 5,009,244, Cl. 137-101.110.

Rockefeller University, The: *See*—
Kappas, Attallah; and Drummond, George S., 5,010,073, Cl. 514-185.000.

Rockwell International Corporation: *See*—
Green, Paul E., 5,010,340, Cl. 341-172.000.
Hrncirik, Dennis J., 5,010,506, Cl. 364-721.000.

Rockwell, Marshall A., III. Optical waveguide display system. 5,009,483, Cl. 350-96.240.

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Knop, Albert W.; and van Banning, Robert J. H. M., 5,009,031, Cl. 47-64.000.

Rode, Leon A.: *See*—
Roderick, Zackary A.; and Rode, Leon A., 5,009,306, Cl. 198-414.000.

Roderick, Zackary A.; and Rode, Leon A., to Simplimatic Engineering Company. Printed circuit board conveyor and method. 5,009,306, Cl. 198-414.000.

Rodgers, Cyril: *See*—
Fay, Fredric S.; Fogarty, Kevin E.; and Rodgers, Cyril, 5,009,488, Cl. 350-315.000.

Rodriguez-Cavazos, Enrique, to RCA Licensing Corporation. High voltage stabilization circuit for video display apparatus. 5,010,281, Cl. 315-411.000.

Roe, William J.: *See*—
Kerr, E. Michael; Connelly, Lawrence J.; Roe, William J.; and Vallowe, Robert M., 5,009,873, Cl. 423-320.000.

Roeske, Robert G.: *See*—
Luallin, John M.; Nagengast, William E.; and Roeske, Robert G., 5,010,455, Cl. 362-61.000.
Rogers Corporation: *See*—
Gordon, Herman B.; Owens, Mark J.; Rubinstein, Leon; and Simpson, Scott, 5,009,607, Cl. 439-67.000.
Rogge, Dieter; and Wallmann, Wilfried, to Windmoller & Holscher. Rotary press comprising an endless block belt. 5,009,157, Cl. 101-178.000.
Rohrer, Kurt: *See*—
Gugel, Bernd; Kaufmann, Clemens; Kitzberger, Herbert; and Rohrer, Kurt, 5,009,529, Cl. 400-124.000.
Roland Corporation: *See*—
Yamamori, Takenori, 5,009,147, Cl. 84-618.000.
Roldan, Antoine; and Demilliere-Vergnais, Daniel, to Application Des Gaz. Hot air generating device with a catalytic burner. 5,009,592, Cl. 432-222.000.
Roll, Daniel O.: *See*—
Hawkins, William G.; Burke, Cathie J.; Roll, Daniel O.; Hartman, Pamela J.; and Atkinson, Diane, 5,010,355, Cl. 346-140.00R.
Roller, Timothy J.; and Thiele, Robert E., to Adanlock. Lateral file drawer position lock. 5,009,470, Cl. 312-325.000.
Romig, Kenneth L., to General Motors Corporation. Anti-rotation device for the release bearing of a manually operated clutch. 5,009,300, Cl. 192-98.000.
Ron, Eyal; Staubli, Andrea; and Langer, Robert S., to Massachusetts Institute of Technology. Poly(amide-and imide-co-anhydride) for biological application. 5,010,167, Cl. 528-328.000.
Ronsen, Bruce; Arora, Sudershan K.; and Thomas, Albert V., to 501 Greenwich Pharmaceuticals Incorporated. 3,5,6-substituted derivatives of 1,2-O-isopropylidene-α,D-glucofuranose and intermediates for preparing these derivatives. 5,010,058, Cl. 514-23.000.
Roobeek, Cornelis F.: *See*—
Van Leeuwen, Petrus W. N. M.; and Roobeek, Cornelis F., 5,010,172, Cl. 528-392.000.
Roodenburg, Hendrik F.: *See*—
Roodenburg, Joop; and Roodenburg, Hendrik F., 5,009,412, Cl. 272-2.000.
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Roos, Antonius, to Akzo N.V. Process for manufacturing yarns by meltspinning polyethylene terephthalate. 5,009,829, Cl. 264-210.600.
Roquette Freres: *See*—
Serpelloni, Michel, 5,009,914, Cl. 426-582.000.
Rosenbrand, Gerrit G.; and Wong, Pui K., to Shell Oil Company. Polymerization of carbon monoxide/olefin with at least one tetra aryl diphosphine ligand. 5,010,170, Cl. 528-392.000.
Rosenthal, Eugene J.: *See*—
Kutzavitch, Walter G.; and Rosenthal, Eugene J., 5,010,306, Cl. 330-284.000.
Ross, David L. Electrified bulletin board with illuminable push-pin. 5,010,463, Cl. 362-253.000.
Ross, Lawrence M. Bow draw stop. 5,009,216, Cl. 124-88.000.
Rossio, Charles: *See*—
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Rostra Engineered Components: *See*—
Motykiewicz, Krystyn, 5,010,312, Cl. 335-261.000.
Rothgery, Eugene F., to Olin Corporation. Use of pyrithione for the control of moss. 5,009,700, Cl. 71-94.000.
Rottman, Fritz M.: *See*—
Schuler, Linda A.; Gorski, Jack; Hurley, Walter L.; Bremel, Robert D.; and Rottman, Fritz M., 5,010,011, Cl. 435-252.300.
Rouillot, Michel, to Glaenzer-Spicer. Body having a composite structure for a transmission joint and its method of production. 5,009,628, Cl. 464-111.000.
Roumeliotis, Panayiotis: *See*—
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Rousset, Joseph: *See*—
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Rubinstein, Leon: *See*—
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Ruder, Carl J.; Haney, Ronald J.; Chutorash, Richard J.; Bostad, Wayne W.; Zweig, Arnold A.; and Payne, Lyle B., to Yellow Freight System, Inc. Mixed freight handling system. 5,009,560, Cl. 414-392.000.
Rudy, Wayne M., to Engelhard Corporation. Staged three-way conversion catalyst and method of using the same. 5,010,051, Cl. 502-304.000.
Rue, Charles V.; van de Merwe, Ronald H.; Bauer, Ralph; Pellow, Scott W.; Cottringer, Thomas E.; and Klok, Richard J., to Norton Company. Sintered sol gel alumina abrasive filaments. 5,009,676, Cl. 51-309.000.
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Ruppert, Heinrich W.: *See*—
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Rutledge, Gary L., to Marrelli, John C. Plastic film bag with integral plastic film tie element, and associated fabrication methods. 5,009,517, Cl. 383-72.000.
Rutter, William J.; and Santi, Daniel V., to University of California, The Regents of the. General method for producing and selecting peptides with specific properties. 5,010,175, Cl. 530-334.000.
Ruzo, Luis O.: *See*—
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Ryan, Walter S., to Pennsylvania Rail Car Company. Box car door seal. 5,009,036, Cl. 49-485.000.
Rzechula, Michael J., to Slcik Ice Limited. Additive composition for treating water used to form ice and methods. 5,010,127, Cl. 524-379.000.
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Scholsky, Kevin M.; Larsen, Lisa M.; and Kruse, Rodger C., 5,010,166, Cl. 528-323.000.
Sacco, Bruno; Tomforde, Johann; Abb, Thomas; and Stenemann, Bruno, to Daimler-Benz AG. Modular display system. 5,009,042, Cl. 52-36.000.
Sacks, Michael D.; and Lee, Hae-Weon, to University of Florida. Alumina-or alumina/zirconia-silicon carbide whisker ceramic composites and methods of manufacture. 5,009,822, Cl. 264-23.000.
Sadler, Thomas E. Bed mounted television stand. 5,009,379, Cl. 248-174.000.
Saepter Manufacturing Company Limited: *See*—
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Sahi, Carl R., to Bio-Plexus, Inc. Self-blunting needle assembly for use with a catheter, and catheter assembly using the same. 5,009,642, Cl. 604-158.000.
Sahira, Kensho: *See*—
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Sahoo, Soumya P.: *See*—
Biftu, Tesfaye; Chabala, John C.; Bugianesi, Robert L.; Ponpipom, Mitree M.; and Sahoo, Soumya P., 5,010,100, Cl. 514-461.000.
Saint-Gobain Vitrage: *See*—
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Saishoji, Toshihide: *See*—
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Saito, Kenji, to Fuji Photo Film Co., Ltd. Method and apparatus for adjusting chroma. 5,010,393, Cl. 358-29.000.
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Sato, Izumi; Saito, Koji; and Inoue, Takashi, 5,009,103, Cl. 73-597.000.
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Sakae Riken Kogyo Co., Ltd.: *See*—
Watanabe, Toshiharu, 5,009,020, Cl. 40-547.000.
Sakaegi, Yuji; and Fukushima, Nobuo, to Canon Kabushiki Kaisha. Tracking device and method. 5,010,423, Cl. 360-77.060.
Sakaguchi, Yoshikazu: *See*—
Harada, Kyouji; Kato, Eiji; Sakaguchi, Yoshikazu; Watanabe, Suzuaki; and Hoshino, Akira, 5,009,290, Cl. 188-71.500.
Sakai, Jun: *See*—
Yamamoto, Takemi; Nagata, Osamu; Komiya, Ryohei; Sakai, Jun; and Ban, Yoshiyuki, 5,010,360, Cl. 355-20.000.
Sakai, Kazuo: *See*—
Nishimura, Kohsuke; and Sakai, Kazuo, 5,010,376, Cl. 357-17.000.
Sakai, Kunihiro: *See*—
Eguchi, Ken; Kawada, Haruki; Sakai, Kunihiro; Tomida, Yoshinori; Matsuda, Hiroshi; Tsuboyama, Akira; Takimoto, Kiyoshi; and Takamatsu, Osamu, 5,009,489, Cl. 350-341.000.
Sakai, Mieko. Process for fabricating a circular frame. 5,009,733, Cl. 156-184.000.
Sakai, Takashi: *See*—
Kuzuya, Susumu; Shimizu, Seiji; Kato, Mikio; Ishikawa, Yujiro; Sakai, Takashi; and Yuki, Eiji, 5,009,530, Cl. 400-188.000.

Sakai, Yuji: *See*—
Yamada, Takehito; Tanimoto, Kazushi; Sakai, Yuji; Muraoka, Takao; Inoue, Tetsuo; and Takada, Yoshinao, 5,010,430, Cl. 360-103.000.

Sakakibara, Yoshikazu: *See*—
Kuki, Nobuyuki; Isomura, Yukio; Suzumura, Hirokazu; Sakakibara, Yoshikazu; and Ishihara, Hiroshi, 5,009,035, Cl. 49-352.000.

Sakamaki, Iwao, to Sakamaki Mfg. Co., Ltd. Chuck for tools. 5,009,439, Cl. 279-62.000.

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Sakamaki, Iwao, 5,009,439, Cl. 279-62.000.

Sakamoto, Hiroaki; Fujikura, Masahiro; and Mukai, Toshio, to Nippon Steel Corporation. Rare-earth antisotropic powders and magnets and their manufacturing processes. 5,009,706, Cl. 75-244.000.

Sakamoto, Ken: *See*—
Kawakami, Toshikatsu; Fukuda, Shin; Shinbo, Hiroyasu; Unemura, Toyoaki; Sakamoto, Ken; and Kondo, Tomoji, 5,010,406, Cl. 358-147.000.

Sakanishi, Masayuki; and Ishii, Takaaki, to Kabushiki Kaisha Toshiba. Electronic volume device. 5,010,577, Cl. 381-104.000.

Sakano, Akio: *See*—
Yoshida, Kimiyoshi; Sakano, Akio; Tamori, Hirofumi; and Chatani, Masayuki, 5,010,579, Cl. 382-13.000.

Sakanoue, Hitoyuki: *See*—
Sasame, Akira; Sakanoue, Hitoyuki; Takeuchi, Hisao; Miyake, Masaya; Yamakawa, Akira; Yushio, Yasuhisa; and Akazawa, Hitoshi, 5,010,388, Cl. 357-70.000.

Sakashita, Kiichiro: *See*—
Yoshida, Satoshi; Nakahara, Toshiaki; Tanikawa, Hirohide; and Sakashita, Kiichiro, 5,009,973, Cl. 430-45.000.

Sakuma, Shuji; Atsumi, Kiminori; and Fujita, Keijiro, to Kabushiki Kaisha Sangi. Antimicrobial hydroxyapatite powders and methods for preparing them. 5,009,898, Cl. 424-618.000.

Sakura Color Products Corp.: *See*—
Inoue, Hiroshi; Yokono, Wataru; and Okuda, Yasuji, 5,009,536, Cl. 401-198.000.
Sugiura, Koji, 5,010,120, Cl. 523-219.000.

Sakurai, Shungo: *See*—
Ueda, Makoto; Ando, Yoshihira; Sakurai, Shungo; and Yoshioka, Ritsuo, 5,009,840, Cl. 376-435.000.

Sakurai, Tadashi: *See*—
Ohmae, Tadayuki; Sakurai, Tadashi; and Asao, Kouichiro, 5,009,951, Cl. 428-294.000.

Sakuta, Masaharu; Urano, Toshiharu; Tanaka, Kyoichi; Sugiyama, Masashi; Endoh, Shyuzo; and Fujioka, Keisuke, to Fujisawa Pharmaceutical Company, Ltd.; Takenaka Komuten Company, Ltd.; and Nippon Nyukazai Company, Ltd. Cement composition and a process for preparation thereof. 5,009,713, Cl. 106-727.000.

Salazar, Jose A.: *See*—
Galiasso, Roberto; Morales, Alfredo; and Salazar, Jose A., 5,009,768, Cl. 208-89.000.

Salmon, Roger: *See*—
McDonald, Edward; Salmon, Roger; Whittle, Alan J.; and Hutchings, Michael G., 5,010,200, Cl. 546-245.000.

Salomon S.A.: *See*—
Laudet, Jean-Luc; and Rullier, Pierre, 5,008,986, Cl. 24-289.000.

Saluzzo, Sergio: *See*—
Di Nunzio, Vittorio; Giaccardi, Eraldo; and Saluzzo, Sergio, 5,009,213, Cl. 123-620.000.

Samsung Electron Devices Co., Ltd.: *See*—
Kwang-sik, Lee; and Chul-woo, Kim, 5,010,464, Cl. 362-284.000.

SamSung Electronics Co., Ltd.: *See*—
Chun, Soon-Ik, 5,010,557, Cl. 375-1.000.

Sanada, Koichi: *See*—
Ikeda, Kazunari; and Sanada, Koichi, 5,009,732, Cl. 156-177.000.

Sanada, Satoru: *See*—
Ohkuma, Hiroya; and Sanada, Satoru, 5,010,537, Cl. 369-44.320.

Sanbuichi, Hiroshi: *See*—
Nakagawa, Toyoaki; Sanbuichi, Hiroshi; Terasaka, Katsunori; and Saito, Makoto, 5,009,210, Cl. 123-489.000.

Sanden Corporation: *See*—
Gonda, Hideyuki, 5,009,297, Cl. 192-84.00C.

Sandoz Pharmaceuticals Corp.: *See*—
Handley, Dean A.; Houlihan, William J.; and Weinstein, David B., 5,010,067, Cl. 514-75.000.

Sang Wook Suh International: *See*—
Kim, Jeong Y., 5,010,223, Cl. 219-10.770.

Sankyo Seiki Mfg. Co., Ltd.: *See*—
Kitajima, Kimio; and Kiuchi, Hiroyuki, 5,010,283, Cl. 318-373.000.

Sannel, Benjamin H.; Miller, Steven A.; and Sells, Robert A., to Datacard Corporation. Output hopper apparatus. 5,009,332, Cl. 209-652.000.

Sano, Shigeaki: *See*—
Moriwaki, Masafumi; Sano, Shigeaki; Hatakeyama, Katsunori; Yamada, Hiroshi; and Nouno, Youzou, 5,010,213, Cl. 178-18.000.

Sansevero, Frank M., to Otis Elevator Company. Curved escalator with fixed center constant radius path of travel. 5,009,302, Cl. 198-328.000.

Santi, Daniel V.: *See*—
Rutter, William J.; and Santi, Daniel V., 5,010,175, Cl. 530-334.000.

Santoh, Tsuyoshi: *See*—
Mihara, Chieko; Santoh, Tsuyoshi; Sugata, Hiroyuki; and Fukui, Tetsuro, 5,009,987, Cl. 430-495.000.

Sanyo Electric Co., Ltd.: *See*—
Arai, Takeshi, 5,010,421, Cl. 360-32.000.
Naganuma, Hiroshi; Sato, Kenji; Yamamoto, Masashi; Kubota, Toshiaki; Hayashi, Hiroshige; and Ishizaka, Yoshirou, 5,009,080, Cl. 62-256.000.
Tsuruta, Shigeru; and Masuda, Sadao, 5,010,474, Cl. 364-167.010.
Wataguchi, Masaharu, 5,010,383, Cl. 357-36.000.

Saotome, Kunio. Multicolor pressure-sensitive illuminating display platform. 5,010,461, Cl. 362-101.000.

Saren, Aimo: *See*—
Maenpaa, Matti; Lehtoluoma, Teuvo; Henttinen, Kauko; Jokipalo, Pertti; Saren, Aimo; and Pirinen, Seppo, 5,009,096, Cl. 72-239.000.

Sarko, Leonard S.; and Lyon, Richard S., to Inorganic Recycling Incorporated. Inorganic recycling process. 5,009,511, Cl. 366-348.000.

Sarkozi, Jeff. Abdominal exercise device. 5,009,417, Cl. 272-145.000.

Sarli, Michael S.: *See*—
Kovacs, Richard C.; Krambeck, Frederick J.; and Sarli, Michael S., 5,009,853, Cl. 422-144.000.

Sarrasin, Michael J., to Millipore Corporation. Multi-well filtration apparatus. 5,009,780, Cl. 210-238.000.

Sasaki, Hiroyuki; Shimamura, Masato; Noda, Juichi; Hanafusa, Hiroaki; and Takeuchi, Yoshiaki, to Japan Aviation Electronics Industry Limited; and Nippon Telegraph and Telephone Corporation. Method for the manufacture of an optical fiber coupler. 5,009,478, Cl. 350-96.150.

Sasaki, Yoshiyuki; Tsunashima, Kenji; Ookuma, Ikuo; and Fujii, Toshifumi, to Mitsubishi Denki Kabushiki Kaisha. Characteristics corrector. 5,010,404, Cl. 358-139.000.

Sasame, Akira; Sakanoue, Hitoyuki; Takeuchi, Hisao; Miyake, Masaya; Yamakawa, Akira; Yushio, Yasuhisa; and Akazawa, Hitoshi, to Sumitomo Electric Industries, Ltd. Connection structure between components for semiconductor apparatus. 5,010,388, Cl. 357-70.000.

Saslaw, Irving M.; Topalian, Harry H.; and Rispoli, Joseph M., to Saslaw & Topalian Associates, Inc. Method for frying comestibles in a microwave oven. 5,009,904, Cl. 426-243.000.

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Saslaw, Irving M.; Topalian, Harry H.; and Rispoli, Joseph M., 5,009,904, Cl. 426-243.000.

Sata, Ichiko: *See*—
Suzuki, Hitoshi; Shiotani, Shinobu; Tokunaga, Shinji; Hirai, Tokuyuki; Fukumochi, Yoji; Kugimiya, Shuzo; and Sata, Ichiko, 5,010,486, Cl. 364-419.000.

Sato, Izumi; Saito, Koji; and Inoue, Takashi, to Tokyo Keiki Co., Ltd. Ultrasonic thickness measuring method and apparatus. 5,009,103, Cl. 73-597.000.

Sato, Katsumo: *See*—
Hirano, Yoshinao; Sato, Katsumo; Nagamori, Shigeru; Murata, Katsuhide; Horikiri, Kazuhito; and Shirai, Junji, 5,009,585, Cl. 425-174.400.

Sato, Kazuhiro; Kishi, Tomomi; Umeda, Koji; Uchida, Yasushi; and Takeuchi, Masahiko, to Toyota Jidosha Kabushiki Kaisha. Automatic seam welding apparatus. 5,010,226, Cl. 219-81.000.

Sato, Kenji: *See*—
Naganuma, Hiroshi; Sato, Kenji; Yamamoto, Masashi; Kubota, Toshiaki; Hayashi, Hiroshige; and Ishizaka, Yoshirou, 5,009,080, Cl. 62-256.000.

Sato, Nobuo: *See*—
Enari, Hiroyuki; Kumazawa, Satoru; Shimizu, Susumu; Ito, Atsushi; Sato, Nobuo; and Saishoji, Toshihide, 5,010,206, Cl. 548-262.200.

Sato, Shigeki, to Nissan Motor Co., Ltd. Vehicle engine and suspension vibration control arrangement. 5,009,402, Cl. 267-140.100.

Sato, Shuichi; Koguchi, Yoshimi; and Kobayashi, Yoshiharu, to SSMC Inc. Thread cutting unit having a rotatably driverble cutting knife and loop spreading plate for a sewing machine. 5,009,177, Cl. 112-292.000.

Sato, Yasushi: *See*—
Araya, Junji; Ohzeki, Yukihiro; Miyamoto, Toshio; Hiroshima, Koichi; Sato, Yasushi; and Nakahata, Kimio, 5,010,370, Cl. 355-274.000.

Satoh, Masaaki: *See*—
Tsuji, Tsuyoshi; Satoh, Masaaki; and Yunoki, Masayuki, 5,009,775, Cl. 210-85.000.

Satoh, Masayasu: *See*—
Takeda, Takayuki; and Satoh, Masayasu, 5,010,538, Cl. 369-44.360.

Satoh, Seiki: *See*—
Yamada, Shinjiro; Satoh, Seiki; Mabuchi, Kazuichi; Kitao, Shiei; and Egawa, Yoshiaki, 5,010,264, Cl. 310-72.000.

Saunders, Colin D.: *See*—
Smith, Martin P.; and Saunders, Colin D., 5,010,247, Cl. 250-223.00R.

Sauter, Ulrich: *See*—
Seidel, Willi; Ehniss, Roland; Skabrond, Klaus; Sauter, Ulrich; Maier, Ulrich; and Ebner, Roland, 5,009,128, Cl. 74-866.000.

Savchuk, Valentin A.: *See*—
Fedin, Marat A.; Kuznetsova, Tatyana A.; Lysenkov, Viktor I.; Novikova, Svetlana A.; Savchuk, Valentin A.; Sedelnikov, Anatoly I.; Shabunya, Vera P.; Udarov, Boris G.; Tikhonova, Tatyana S.; Polyakova, Nina P.; and Paklin, Sergei I., 5,010,106, Cl. 514-546.000.

Savedra, Emilio, Jr. Tree lifter. 5,009,558, Cl. 414-23.000.

Sawada, Masahiro: *See*—
Ikeda, Hayato; Sawada, Masahiro; Nakamura, Norihiko; and Yokomachi, Naoya, 5,009,286, Cl. 184-6.170.
Ikeda, Hayato; Sawada, Masahiro; and Nakamura, Norihiko, 5,009,574, Cl. 417-222.000.

Sawyer, Alan G.; Hughes, Dale L.; and Petree, Edwyn H., to Sawyer, Alan G.; and Hughes, Dale L. Cable stripping tool. 5,009,006, Cl. 30-90.600.

Saxod, Michel; and Fougerolle, Fabrice. Method and apparatus for making sealing rings of the radial type with sealing lip of fluoroplastic. 5,009,742, Cl. 156-633.000.

Saxon, Ronald L.: *See*—
Lombardino, Paul A.; Saxon, Ronald L.; and Supchak, Dennis W., 5,009,561, Cl. 414-412.000.

Sbarra, Anthony J. Method and test kit for the determination of fetal pulmonary maturity status. 5,010,016, Cl. 436-63.000.

Scannell, Michael B., to Commonwealth Edison Company. Multi-edge extender board. 5,010,446, Cl. 361-398.000.

Scarberry, Eugene N., to Respironics Inc. Pump apparatus. 5,009,635, Cl. 604-27.000.

Schade, Gerold; Marhold, Albrecht; and Brandes, Wilhelm, to Bayer Aktiengesellschaft. Imidazolyl compounds and their use as fungicides. 5,010,094, Cl. 514-399.000.

Schaefer, Roland, to Kulzer & Co. GmbH. Composite dental prosthesis element formed of filled acrylate/methacrylate polymers. 5,009,597, Cl. 433-212.100.

Schaffer, Leslie E.: *See*—
Garg, Diwakar; Mueller, Carl F.; Schaffer, Leslie E.; and Dyer, Paul N., 5,009,966, Cl. 428-627.000.

Scharf, Gunther: *See*—
Sprintschnik, Gerhard; Niederstaetter, Walter; Reiss, Kurt; von Asten, Wolfgang; Scharf, Gunther; and Grzembra, Barbara, 5,009,722, Cl. 148-2.000.

Scharf, Helmut, to Huels Aktiengesellschaft. Zirconium dioxide powder, processes for its preparation and its use for the production of sintered articles. 5,009,878, Cl. 423-608.000.

Schatz, Douglas S.: *See*—
Siefkes, Jerry D.; Harpold, John G.; and Schatz, Douglas S., 5,009,764, Cl. 204-298.080.

Scheerer, Rainer; and Moll, Eranz, to Agfa-Gevaert Aktiengesellschaft. Photographic recording material. 5,009,990, Cl. 430-539.000.

Scheffler, Glenn W., to International Fuel Cells Corporation. Fuel cell power plant fuel control. 5,009,967, Cl. 429-23.000.

Scheller, Clifford D.; Collins, Aaron A.; and Hansen, Joseph M., to Compuquest, Inc. High speed, error-free data transmission system and method. 5,010,553, Cl. 371-35.000.

Schenk, Robert J. Removable rigid support structure for circuit cards. 5,009,311, Cl. 206-332.000.

Schering Aktiengesellschaft: *See*—
Bittler, Dieter; Laurent, Henry; Rach, Petra; and Topert, Michael, 5,010,071, Cl. 514-178.000.
Braestrup, Claus T.; Nielsen, Mogens C.; Christensen, Joergen A.; Engelstoft, Mogens; Schou, Henning; Eder, Ulrich; Neef, Gunter; Huth, Andreas; Rahtz, Dieter; and Schmiechen, Ralph, 5,010,077, Cl. 514-228.800.
Skuballa, Werner; Dahl, Helmut; Vorbrueggen, Helmut; Loge, Olaf; and Thierauch, Karl-Heinz, 5,010,065, Cl. 514-58.000.

Scherpenberg, Francis A.: *See*—
Dias, Donald R.; Lee, Robert D.; Bolan, Michael L.; and Scherpenberg, Francis A., 5,010,331, Cl. 340-825.310.

Scherrer, Fernand; and Rousset, Joseph. Device for air-conditioning premises with exchange of heat energy by low temperature infrared radiation. 5,010,234, Cl. 219-213.000.

Schettler, Helmut: *See*—
Gansauge, Peter; Kreuter, Volker; and Schettler, Helmut, 5,010,389, Cl. 357-67.000.

Schiedegger, Charles E.: *See*—
MacLeod, Richard J.; Chubb, Norman L.; and Schiedegger, Charles E., 5,009,149, Cl. 98-42.210.

Schill, John M.; and Schill, William C. Retainer assemblies for elongated objects. 5,009,350, Cl. 224-324.000.

Schill, William C.: *See*—
Schill, John M.; and Schill, William C., 5,009,350, Cl. 224-324.000.

Schirmer, Ulrich: *See*—
Keil, Michael; Schirmer, Ulrich; Kast, Juergen; Kolassa, Dieter; Wuerzer, Bruno; Meyer, Norbert; Rademacher, Wilhelm; Jung, Johann; and Carlson, Dale R., 5,009,702, Cl. 71-100.000.

Schlageter, Alan G.: *See*—
Fox, Elizabeth D.; and Schlageter, Alan G., 5,010,441, Cl. 361-221.000.

Schlegel Corporation: *See*—
McManus, Michael J.; Berry, David H.; and Dover, Harold P., 5,009,947, Cl. 428-122.000.

Schlegel, Reinhold: *See*—
Bloemacher, Martin; Schlegel, Reinhold; and Weinand, Dieter, 5,009,841, Cl. 419-23.000.

Schlensog, Klaus: *See*—
Riedweg, Robert; and Schlensog, Klaus, 5,009,638, Cl. 604-74.000.

Schlingmann, Merten: *See*—
Wullbrandt, Dieter; Keller, Reinhold; Schlingmann, Merten; Holla, Wolfgang; and Schneider, Manfred, 5,010,012, Cl. 435-280.000.

Schlumberger Industries: *See*—
Grasdepot, Francois, 5,009,107, Cl. 73-705.000.

Schlumberger Industries, Inc.: *See*—
Coppola, Richard; and Khandaghabadi, Farrokh, 5,010,335, Cl. 340-870.280.

Schmalbach-Lubeca AG: *See*—
Bolte, Georg, 5,009,364, Cl. 229-123.200.

Schmalzl, Ekkehard. Multi-directional drive for roller conveyors or similar. 5,009,304, Cl. 198-372.000.

Schmid, Kurt: *See*—
Fedter, Horst; Grunwald, Werner; Nolting, Peter; de la Prieta, Claudio; and Schmid, Kurt, 5,010,315, Cl. 338-7.000.
Grunwald, Werner; Holfelder, Gerhard; De La Prieta, Claudio; and Schmid, Kurt, 5,009,708, Cl. 106-105.000.

Schmidt, Erhard: *See*—
Hassler, Dietrich; and Schmidt, Erhard, 5,009,232, Cl. 128-660.030.

Schmidt, Ernst; Stehmeier, Heinz; Ruppert, Heinrich W.; Gatschmann, Klaus G.; and Schutze, Gunter, to Martin Brinkmann AG. Device for making cigarettes. 5,009,237, Cl. 131-70.000.

Schmidt, Harald H., to Mold-Masters Limited. Thermocouple construction. 5,009,718, Cl. 136-232.000.

Schmidt, Richard R.; Baer, Thomas; Zimmerman, Peter; and Wendel, Albrecht, to Solco Basel AG. Pharmaceutical products and lactosyl compounds. 5,010,059, Cl. 514-25.000.

Schmidt, William L.: *See*—
Fox, Leslie R.; Wade, Paul C.; and Schmidt, William L., 5,010,038, Cl. 437-215.000.

Schmiechen, Ralph: *See*—
Braestrup, Claus T.; Nielsen, Mogens C.; Christensen, Joergen A.; Engelstoft, Mogens; Schou, Henning; Eder, Ulrich; Neef, Gunter; Huth, Andreas; Rahtz, Dieter; and Schmiechen, Ralph, 5,010,077, Cl. 514-228.800.

Schmitt, Hans J.; and Blazek, Vladimir, to Fa. Nattermann Arzneimittel GmbH. Microprocessor controlled apparatus for the noninvasive determination of peripheral outflow and flow disturbances. 5,009,231, Cl. 128-633.000.

Schnatterer, Albert: *See*—
Maurer, Fritz; Lantzsch, Reinhard; Fiege, Helmut; and Schnatterer, Albert, 5,010,193, Cl. 544-243.000.

Schneider, Alfred; Loos, Horst; and Fischbach, Karl H., to Siegenia-Frank KG. Closure support. 5,009,034, Cl. 49-192.000.

Schneider, Karl D. Transportation of hospital patients. 5,009,442, Cl. 280-304.100.

Schneider, Manfred: *See*—
Wullbrandt, Dieter; Keller, Reinhold; Schlingmann, Merten; Holla, Wolfgang; and Schneider, Manfred, 5,010,012, Cl. 435-280.000.

Schneider (USA) Inc.: *See*—
Hamlin, Robert N.; Shockey, Rick L.; and Tassel, Robert A. V., 5,009,659, Cl. 606-159.000.

Schoenberger, Jack O.: *See*—
Branam, Timothy R.; Roberts, Jeffrey J.; and Schoenberger, Jack O., 5,009,101, Cl. 73-168.000.

Schoenherr, Walter: *See*—
Eckhardt, Fritz; Helbig, Peter; and Schoenherr, Walter, 5,010,272, Cl. 313-579.000.

Schoenleben, Willibald: *See*—
Perner, Johannes; Diessel, Paul; Hartmann, Heinrich; Denzinger, Walter; Oftring, Alfred; and Schoenleben, Willibald, 5,009,805, Cl. 252-174.240.

Schoeps, Jochen: *See*—
Eckel, Thomas; Leitz, Edgar; Wittmann, Dieter; Ott, Karl-Heinz; Peters, Horst; and Schoeps, Jochen, 5,010,135, Cl. 525-63.000.

Schoettle, Klaus; Buhk, Artur; and Gliniorz, Lothar, to BASF Aktiengesellschaft. Tape cassette having a two-reel brake system having identical brake levers therefor. 5,010,434, Cl. 360-132.000.

Schollhorn, Wolf D. Process for forming urea-formaldehyde resin and use. 5,010,164, Cl. 528-243.000.

Scholsky, Kevin M.; Larsen, Lisa M.; and Kruse, Rodger C., to S. C. Johnson & Son, Inc. Process and apparatus for producing polyol polymers and polyol polymers so produced. 5,010,166, Cl. 528-323.000.

Schottli AG: *See*—
Corvaglia, Romeo; and Schottli, Martin, 5,009,587, Cl. 425-549.000.

Schottli, Martin: *See*—
Corvaglia, Romeo; and Schottli, Martin, 5,009,587, Cl. 425-549.000.

Schou, Henning: *See*—
Braestrup, Claus T.; Nielsen, Mogens C.; Christensen, Joergen A.; Engelstoft, Mogens; Schou, Henning; Eder, Ulrich; Neef, Gunter; Huth, Andreas; Rahtz, Dieter; and Schmiechen, Ralph, 5,010,077, Cl. 514-228.800.

Schrader, James R.: *See*—
Pember, David A.; and Schrader, James R., 5,009,175, Cl. 111-173.000.

Schramm, Laurier L.; and Smith, Russell G., to Alberta Energy Company Ltd.; Canadian Occidental Petroleum Ltd.; Esso Resources Canada Limited, part interest to each; Gulf Canada Limited; Her Majesty the Queen in right of the Province of Alberta; HBOG-Oil Sands Limited Partnership; PanCanadian Petroleum Limited; and Petro-Canada Inc. Monitoring surfactant content to control hot water process for tar sand. 5,009,773, Cl. 208-391.000.

Schreiber, William F.; Lippman, Andrew B.; Adelson, Edward H.; and Netravali, Aran N., to Massachusetts Institute of Technology. Receiver-compatible enhanced definition television system. 5,010,405, Cl. 358-141.000.

Schreinemacher, Herbert J.: *See*—
Hennings, Detlev F. K.; and Schreinemacher, Herbert J., 5,009,876, Cl. 423-598.000.

Schroll, Craig R.: *See*—
Guthrie, Robin J.; Katz, Murray; and Schroll, Craig R., 5,009,968, Cl. 429-26.000.

Schruff, Herbert. Blind riveting nut. 5,009,556, Cl. 411-15.000.

Schuchardt, Jonathan L., to Arco Chemical Technology, Inc. Recovery of double metal cyanide complex catalyst from a polymer. 5,010,047, Cl. 502-24.000.

Schuler, Linda A.; Gorski, Jack; Hurley, Walter L.; Bremel, Robert D.; and Rottman, Fritz M., to Wisconsin Alumni Research Foundation. Bovine placental lactogen gene. 5,010,011, Cl. 435-252.300.

Schultz, John F.: *See*—
Madey, John M. J.; Benson, Stephen V.; Schultz, John F.; and Cutolo, Antonello, 5,010,555, Cl. 372-2.000.

Schutze, Gunter: *See*—
Schmidt, Ernst; Stehmeier, Heinz; Ruppert, Heinrich W.; Gatschmann, Klaus G.; and Schutze, Gunter, 5,009,237, Cl. 131-70.000.

Schwaebische Huettenwerke GmbH: *See*—
Haerle, Hans A., 5,009,857, Cl. 422-180.000.

Schwalge, Barbara: *See*—
Plath, Peter; Eicken, Karl; Rueb, Lothar; Schwalge, Barbara; Westphalen, Karl-Otto; and Wuerzer, Bruno, 5,009,701, Cl. 71-96.000.

Schwank, Johannes: *See*—
Villa-Garcia, Maria A.; and Schwank, Johannes, 5,010,049, Cl. 502-60.000.

Schweizer, Bernhard: *See*—
Lang, Armin; and Schweizer, Bernhard, 5,009,110, Cl. 73-862.330.

Schwendeman, Robert J.; and Kuznicki, William J., to Motorola, Inc. Satellite based simulcast paging system. 5,010,317, Cl. 340-311.100.

Schwetje, Norbert; Sizmann, Rudolf; and Khelifa, Noureddine, to Kali-Chemie AG. Process for adsorption cooling/conditioning by means of low-temperature heat. 5,009,071, Cl. 62-4.000.

Science Accessories Corp.: *See*—
Sindeband, Seymour J.; and Butler, Robert, 5,009,277, Cl. 178-18.000.

Scopazzi, Christopher: *See*—
Antonelli, Joseph A.; Scopazzi, Christopher; and Doherty, Mark M., 5,010,140, Cl. 525-269.000.

Scot Industries, Inc.: *See*—
Wilmeth, Thomas S.; Wilmeth, Steven L.; and Foster, Francis E., 5,009,000, Cl. 29-888.020.

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Merriam, David P.; Scott, Dale L.; and Scott, Bryan F., 5,010,568, Cl. 379-107.000.

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Fedin, Marat A.; Kuznetsova, Tatyana A.; Lysenkov, Viktor I.; Novikova, Svetiana A.; Savchuk, Valentin A.; Sedelnikov, Anatoly I.; Shabunya, Vera P.; Udarov, Boris G.; Tikhonova, Tatyana S.; Polyakova, Nina P.; and Paklin, Sergei I., 5,010,106, Cl. 514-546.000.

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Yamazaki, Katsunori; and Nagato, Mitsuo, 5,010,326, Cl. 340-784.000.

Seiko Instruments Inc.: *See*—
Nishikawa, Akira, 5,010,249, Cl. 250-306.000.

Seive, Alain: *See*—
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Grimm, Noel P.; and Sejvar, James, 5,009,836, Cl. 376-260.000.

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Manderfeld, Donald J.; and Sells, Robert A., 5,009,411, Cl. 271-129.000.
Sannel, Benjamin H.; Miller, Steven A.; and Sells, Robert A., 5,009,332, Cl. 209-652.000.

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Gautvik, Kaare M.; Alestrom, Peter; Oven, Tordis B.; and Gabrielsen, Odd S., 5,010,010, Cl. 435-252.300.

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Barker, Allan, 5,009,338, Cl. 215-230.000.

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Seo, Masayoshi, to Sharp Kabushiki Kaisha. Cordless telephone. 5,010,566, Cl. 379-61.000.

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Prange, Charles J., 5,009,242, Cl. 134-113.000.

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O'Connor, James T.; and Courtright, David A., 5,010,559, Cl. 375-116.000.

SGS-Thomson Microelectronics s.r.l.: *See*—
Zisa, Michele; and Palara, Sergio, 5,010,439, Cl. 361-91.000.

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Asanuma, Masato; and Kaneshige, Masatoshi, 5,009,187, Cl. 118-658.000.
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Fujii, Yoshihalu; and Fujita, Yukitoshi, 5,009,410, Cl. 271-127.000.
Hayakawa, Takeshi; Narikawa, Shiro; Ohashi, Kunio; and Tsujimoto, Yoshiharu, 5,009,977, Cl. 430-84.000.
Seo, Masayoshi, 5,010,566, Cl. 379-61.000.
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Tanaka, Syozo; Takushima, Akiro; Shinobu, Yoshiharu; and Eguchi, Masaki, 5,009,084, Cl. 62-441.000.
Terashima, Shigeo; Tsuji, Kentaro; and Fuji, Hiroshi, 5,010,539, Cl. 369-50.000.

Shea, Timothy J.: *See*—
Evans, Thomas L.; Wasserman, Carol B.; Shea, Timothy J.; and Campbell, John R., 5,010,143, Cl. 525-394.000.

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Sheldon, Dunstan P., to Mag-Tek, Inc. Composite ticket processing unit. 5,010,240, Cl. 235-382.000.

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Nathoo, Nazim S.; and Giannopoulos, Fanis, 5,009,409, Cl. 271-90.000.
Rosenbrand, Gerrit G.; and Wong, Pui K., 5,010,170, Cl. 528-392.000.
van Broekhoven, Johannes A. M.; and Miedema, Wiebren A., 5,010,171, Cl. 528-392.000.
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Sheperd, Robin G., to John Wyeth and Brothers Limited. Acylated hexahydropyrimidines. 5,010,196, Cl. 544-335.000.

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Reaves, Thomas A.; and Sherritt, John S., 5,009,326, Cl. 220-441.000.

Sherwin, Harry A.: *See*—
Kline, Loren H.; Sherwin, Harry A.; and Telep, Robert J., 5,009,250, Cl. 137-596.170.

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Shiba, Tetsuo, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor light receiving element. 5,010,381, Cl. 357-30.000.

Shibata, Noriohiko: *See*—
Tanaka, Kazuyuki; Iwami, Etsuji; Matsuzawa, Jun; Mukoyama, Yoshiyuki; Shibata, Noriohiko; Hanawa, Akinori; and Yokota, Mitsuo, 5,009,949, Cl. 428-260.000.

Shibazaki, Nobuo, to Canon Kabushiki Kaisha. Document processing system. 5,010,496, Cl. 364-519.000.

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Shigeno, Haruhisa: *See*—
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Shigesato, Yuzo: *See*—
Harano, Takeshi; Takaki, Satoru; Shigesato, Yuzo; Suzuki, Koichi; Hashimoto, Naoki; Kojima, Hiroyasu; and Oyama, Takuji, 5,009,922, Cl. 427-37.000.

Shigeta, Katsunori; and Nakamura, Haruyuki, to Mitsubishi Denki K.K. Sewing data forming method and device for sewing machine. 5,009,176, Cl. 112-121.120.

Shih, I-Fu; Chang, David B.; Arns, James A.; Moss, Gaylord E.; and Smith, Ronald T., to Hughes Aircraft Company. System of holographic optical elements for testing laser range finders. 5,009,502, Cl. 356-152.000.

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Migita, Masahito; Uda, Tsuyoshi; Kanehisa, Osam; and Shiiki, Masatoshi, 5,010,517, Cl. 365-114.000.

Shikichi, Satoshi: *See*—
Enari, Masahiko; Shikichi, Satoshi; Kawaguchi, Fumiaki; Suzuki, Kenichi; Usui, Masayuki; Matsuoka, Hiroshi; Matsuoka, Kazuhiko; Hosoya, Hideki; Aoki, Akio; and Minoura, Kazuo, 5,010,534, Cl. 369-32.000.

Shima, Yoshinobu; and Kamio, Hiroshi, to NKK Corporation. Apparatus for manufacturing silicon single crystals. 5,009,863, Cl. 422-249.000.

Shimada, Akira, to Hitachi, Ltd. Image information recorder having a resolution density transformation device. 5,010,497, Cl. 364-519.000.

Shimada, Satoshi; and Watanabe, Yuji, to Sony Corporation. Video display system. 5,010,411, Cl. 358-230.000.

Shimamura, Masato: *See*—
Sasaki, Hiroyuki; Shimamura, Masato; Noda, Juichi; Hanafusa, Hiroaki; and Takeuchi, Yoshiaki, 5,009,478, Cl. 350-96.150.

Shimano Industrial Company Limited: *See*—
Nagano, Masashi, 5,009,119, Cl. 74-489.000.

Shimizu, Masayasu: *See*—
Noda, Hidetoshi; Gocho, Makoto; Shimizu, Masayasu; Komatsu, Osamu; and Inoue, Hideaki, 5,009,707, Cl. 75-375.000.

Shimizu, Noboru: *See*—
Kitada, Masahiro; Shimizu, Noboru; Tanabe, Hideo; and Nakamura, Hitoshi, 5,010,433, Cl. 360-113.000.

Shimizu, Seiji: *See*—
Kuzuya, Susumu; Shimizu, Seiji; Kato, Mikio; Ishikawa, Yujiro; Sakai, Takashi; and Yuki, Eiji, 5,009,530, Cl. 400-188.000.

Shimizu, Shigeru: *See*—
Nakamura, Tomio; Shimizu, Shigeru; and Takeuchi, Kikuko, 5,009,811, Cl. 252-500.000.

Shimizu, Susumu: *See*—
Enari, Hiroyuki; Kumazawa, Satoru; Shimizu, Susumu; Ito, Atsushi; Sato, Nobuo; and Saishoji, Toshihide, 5,010,206, Cl. 548-262.200.

Shimizu, Tokihiko: *See*—
Wakita, Katsuya; Sonoda, Nobuo; Shimizu, Tokihiko; Hotta, Shu; and Soga, Mamoru, 5,009,815, Cl. 252-582.000.

Shimokawahara, Hisashi: *See*—
Maruyama, Hiroshi; Kiryu, Naohiko; Minezaki, Etsuko; Tagashira, Susumu; and Shimokawahara, Hisashi, 5,009,944, Cl. 428-40.000.

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Tsuyuguchi, Hiroshi; Noda, Yasushi; Morita, Tsutomu; and Shimozawa, Kenji, 5,010,246, Cl. 250-216.000.

Shin-Etsu Handotai Company Limited: *See*—
Ibe, Hiroyuki; and Uesugi, Toshiharu, 5,009,864, Cl. 422-249.000.
Ikeda, Yasuhiro, 5,009,860, Cl. 422-250.000.

Shin, Yuaki: *See*—
Arai, Yuji; Shin, Yuaki; Ishiguro, Takashi; and Hamada, Emiko, 5,009,818, Cl. 264-1.003.

Shinbo, Hiroyasu: *See*—
Kawakami, Toshikatsu; Fukuda, Shin; Shinbo, Hiroyasu; Unemura, Toyoaki; Sakamoto, Ken; and Kondo, Tomoji, 5,010,406, Cl. 358-147.000.

Shingai, Sadanori: *See*—
Mori, Kinji; Kunai, Yuko; Akiyama, Masakazu; Kadoya, Tadaaki; Kawano, Katsumi; Miyamoto, Shoji; Nohmi, Makoto; Shingai, Sadanori; and Ihara, Hirokazu, 5,010,479, Cl. 364-200.000.

Shinko Electric Co., Ltd.: *See*—
Kasahara, Nobuo; Watanuki, Masayoshi; Maeno, Satoru; and Ohkuni, Masato, 5,010,372, Cl. 355-313.000.
Nakagawa, Hiroshi; and Maeda, Minoru, 5,010,262, Cl. 310-12.000.

Shinobu, Yoshiharu: *See*—
Tanaka, Syozo; Takushima, Akiro; Shinobu, Yoshiharu; and Eguchi, Masaki, 5,009,084, Cl. 62-441.000.

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Shioda, Atsushi: *See*—
Morita, Kaoru; and Shioda, Atsushi, 5,010,149, Cl. 525-481.000.

Shiokawa, Youichi; Takimoto, Koichi; and Takenaka, Kohei, to Fujisawa Pharmaceutical Co., Ltd. Nitric ester derivative. 5,010,093, Cl. 514-374.000.

Shiotani, Shinobu: *See*—
Suzuki, Hitoshi; Shiotani, Shinobu; Tokunaga, Shinji; Hirai, Tokuyuki; Fukumochi, Yoji; Kugimiya, Shuzo; and Sata, Ichiko, 5,010,486, Cl. 364-419.000.

Shioyama, Tsutomu; Minakami, Ko; Fujii, Takao; and Ohtomi, Koichi, to Kabushiki Kaisha Toshiba. Internal pump for nuclear reactor. 5,009,838, Cl. 376-310.000.

Shipe, Joanne E., to AMP Incorporated. Separable connector assembly for an IC Chip Carrier. 5,009,608, Cl. 439-331.000.

Shirai, Junji: *See*—
Hirano, Yoshinao; Sato, Katsumo; Nagamori, Shigeru; Murata, Katsuhide; Horikiri, Kazuhito; and Shirai, Junji, 5,009,585, Cl. 425-174.400.

Shirai, Tadayoshi; and Hioki, Masahito, to Ishikawa Tekko Kabushiki Kaisha. Ball joint. 5,009,538, Cl. 403-134.000.

Shiraki, Masaru: *See*—
Kosugi, Yoshitsugu; Tanaka, Hideoki; Suzuki, Hideo; and Shiraki, Masaru, 5,010,004, Cl. 435-134.000.

Shirakura, Keizo: *See*—
Ametani, Minoru; Funakoshi, Keigo; Kira, Akihiko; Matsushita, Takao; and Shirakura, Keizo, 5,009,735, Cl. 156-241.000.

Shirey, Roy D.; Nelson, Michael T.; and Laurenzi, Robert J., to Lucas Industries, plc. Very small orifice manufacturing system. 5,010,224, Cl. 219-69.170.

Shirley, Thomas E.: *See*—
Linville, Andrew F., Jr.; and Shirley, Thomas E., 5,010,526, Cl. 367-46.000.

Shiro, Takashi: *See*—
Kawaguchi, Takayuki; Shiro, Takashi; Iwata, Kaoru; and Daido, Takahiro, 5,009,986, Cl. 430-495.000.

Shockey, Rick L.: *See*—
Hamlin, Robert N.; Shockey, Rick L.; and Tassel, Robert A. V., 5,009,659, Cl. 606-159.000.

Shoemaker, Patrick A., to United States of America, Navy. Resistive element using depletion-mode MOSFET's. 5,010,385, Cl. 357-41.000.

Shook, Ed., Jr.: *See*—
Gruber, Milan A., 5,009,050, Cl. 52-408.000.

Shor, Peter S. Refining method. 5,009,755, Cl. 204-111.000.

Shuey, John R.: *See*—
Fogg, Michael W.; Koegel, Keith S.; Shuey, John R.; Zelko, William E.; and Beamenderfer, Robert E., 5,009,614, Cl. 439-497.000.

Shute, Thomas A. Pouch for mounting to a vehicle door. 5,009,458, Cl. 296-37.130.

Shyogo, Inada: *See*—
Yoshimura, Hironori; and Shyogo, Inada, 5,009,705, Cl. 75-240.000.

Shyoji, Ueno: *See*—
Masasumi, Yana; Hitoshi, Nagato; Kiyoshi, Yamada; Shyoji, Ueno; and Kunihiro, Shibuya, 5,009,527, Cl. 400-120.000.

Siddens, Jack K.: *See*—
Brown, Dale G.; Siddens, Jack K.; Diehl, Robert E.; and Wright, Donald P., Jr., 5,010,098, Cl. 514-426.000.

Sidi, Shiraz I.; Guilbert, Paul A.; Desroches, Lise A.; and Plasse, Michel, to Northern Telecom Limited. Telecommunications cable. 5,010,210, Cl. 174-34.000.

Siefkes, Jerry D.; Harpold, John G.; and Schatz, Douglas S., to Advanced Energy Industries, Inc. Apparatus for removal of electrical shorts in a sputtering system. 5,009,764, Cl. 204-298.080.

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Schneider, Alfred; Loos, Horst; and Fischbach, Karl H., 5,009,034, Cl. 49-192.000.

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Erhardt, Werner, 5,010,442, Cl. 361-275.000.
Foell, Helmut; and Lehmann, Volker, 5,010,294, Cl. 324-158.00D.
Hassler, Dietrich; and Schmidt, Erhard, 5,009,232, Cl. 128-660.030.
Lamatsch, Hans; and Vanek, Dieter, 5,010,229, Cl. 219-121.210.
Pfaff, Juergen, 5,010,542, Cl. 370-1.000.
Strandberg, Hans G., 5,010,307, Cl. 331-116.0FE.
Trimborn, Peter, 5,009,782, Cl. 210-360.100.

Siemens Automotive Limited: *See*—
Hueniken, Peter; Gurd, John A.; and Woodman, Douglas, 5,010,217, Cl. 200-61.45R.
Siemens-Bendix Automotive Electronics Limited: *See*—
Sewell, Michael R.; and DeJong, Allan W., 5,010,216, Cl. 200-61.45M.
Siemens Medical Laboratories, Inc.: *See*—
Hernandez, Francisco; and Chamberlain, Jerry, 5,010,562, Cl. 378-125.000.
Siener, Pierre; and Steiner, Antoine, to Institut de Recherches de la Siderurgie Francaise-Irsid. Method and apparatus for the identification of metal surface finishes. 5,010,578, Cl. 382-8.000.
Sievers, Uve, to Mecron Medizinische Produkte GmbH. Marrow nail for the treatment of bone fractures. 5,009,664, Cl. 623-16.000.
Sikkema, Doetze J., to Akzo nv. Aramid polymer from aromatic dicarboxylic acid mixture and aromatic diamine mixture. 5,010,168, Cl. 528-338.000.
Silbermann, Klaus: *See*—
Hirtle, Thomas W.; Cimperman, Frederick J.; and Silbermann, Klaus, 5,009,909, Cl. 426-481.000.
Silver, Jules; and Tarozzi, Richard A. Syringe for dispensing measured quantities of a material. 5,009,645, Cl. 604-207.000.
Silvia, Denis A., to United States of America, Navy. Explosive logic resolver network. 5,009,162, Cl. 102-275.900.
Simmons, Chris B. Apparatus and method for wrapping bundles of newspapers or the like. 5,009,055, Cl. 53-397.000.
Simonsen, Christian: *See*—
Levinson, Arthur; Simonsen, Christian; and Yelverton, Elizabeth M., 5,010,002, Cl. 435-69.200.
Simplimatic Engineering Company: *See*—
Hilbish, Brian K.; Leonard, David W., Sr.; Burgess, Arnold C.; and Burns, David R., 5,009,550, Cl. 406-87.000.
Roderick, Zackary A.; and Rode, Leon A., 5,009,306, Cl. 198-414.000.
Simpson, Scott: *See*—
Gordon, Herman B.; Owens, Mark J.; Rubinstein, Leon; and Simpson, Scott, 5,009,607, Cl. 439-67.000.
Sindeband, Seymour J.; and Butler, Robert, to Science Accessories Corp. Method and apparatus for position determination. 5,009,277, Cl. 178-18.000.
Singh, Baldev: *See*—
Lesher, George Y., deceased; Bacon, Edward R.; Singh, Baldev; and Kuo, Gee-Hong, 5,010,086, Cl. 514-303.000.
Sinofsky, Edward L.: *See*—
Daignault, Kenneth J., Jr.; McNamara, Edward I.; and Sinofsky, Edward L., 5,009,655, Cl. 606-007.000.
Sintim-Damoa, Kwame: *See*—
Minshall, Billy W.; Purohit, Kailash; Nygard, John E.; Sintim-Damoa, Kwame; Giesler, Richard; and Woodworth, Archie, 5,009,654, Cl. 604-410.000.
SIP - Societa Italiana per l'Esercizio Delle Telecomunicazioni P.A.: *See*—
Braglia, Marco; DeFranceschi, Roberto; and Montangero, Paolo, 5,010,253, Cl. 250-399.000.
Sippel, Achim; Kruse, Heinz-Josef; and Becker, Wilfried, to Rheinmetall GmbH. High-explosive projectile. 5,009,167, Cl. 102-524.000.
Sit, Hon P.; Galbi, David; and Chan, Alfred K., to Intel Corporation. Prenormalization for a floating-point adder. 5,010,508, Cl. 364-748.000.
Sit, Sing-Yuen; and Wright, John J., to Bristol-Myers Company. Antihypercholesterolemic tetrazol-1-yl intermediates. 5,010,205, Cl. 548-253.000.
Sizmann, Rudolf: *See*—
Schwetje, Norbert; Sizmann, Rudolf; and Khelifa, Noureddine, 5,009,071, Cl. 62-4.000.
Skabrond, Klaus: *See*—
Seidel, Willi; Ehniss, Roland; Skabrond, Klaus; Sauter, Ulrich; Maier, Ulrich; and Ebner, Roland, 5,009,128, Cl. 74-866.000.
Skalak, Thomas C.: *See*—
Feldman, Marc D.; Skalak, Thomas C.; and Belardinelli, Luiz, 5,009,634, Cl. 604-27.000.
SKF GmbH: *See*—
Brockmuller, Uwe; and Weber, Hans-Gerd, 5,009,525, Cl. 384-576.000.
Dittenhoefer, Thomas, 5,009,524, Cl. 384-475.000.
Skinner, Dale D.; and Thompson, John H., to Westinghouse Electric Corp. Sonar test system and method. 5,010,525, Cl. 367-13.000.
Skuballa, Werner; Dahl, Helmut; Vorbrueggen, Helmut; Loge, Olaf; and Thierauch, Karl-Heinz, to Schering Aktiengesellschaft. Cyclodextrin clathrates of 5-cyanoprostacyclin derivatives and their use as pharmaceutical agents. 5,010,065, Cl. 514-58.000.
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Nolan, John H.; and Skvarce, Dennis H., 5,009,140, Cl. 83-698.000.
Slade, Louise: *See*—
Levine, Harry; Slade, Louise; Van Lengerich, Bernhard; and Pickup, John G., 5,009,900, Cl. 426-96.000.
Slagteriernes Forskningsinstitut: *See*—
Joergensen, Tage W.; and Christensen, Leif, 5,009,191, Cl. 119-20.000.
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Rzechula, Michael J., 5,010,127, Cl. 524-379.000.
Sliger, Kris M.; Moeller, Randolph C.; and Williamson, Scott E., to Baker Hughes Incorporated. Well production apparatus including pump means and thermal absorption means. 5,009,264, Cl. 166-106.000.
Sloan-Kettering Institute for Cancer Research: *See*—
Albino, Anthony; Lloyd, Kenneth; Ikeda, Hisami; and Old, Lloyd, 5,009,995, Cl. 435-7.230.
Smaling, Oral M., to White Consolidated Industires, Inc. Method of manufacturing an outer vacuum cleaner bag for an upright cleaner. 5,009,633, Cl. 493-214.000.
Smart, Charles F.: *See*—
D'Aquila, Anthony; Smart, Charles F.; and Varian, Raymond H., 5,009,354, Cl. 227-2.000.
Smetak, Vincenc: *See*—
Pajgrt, Jan; Smetak, Vincenc; Kalina, Jaroslav; Zemek, Michal; Pus, Milan; and Bucek, Pavel, 5,009,253, Cl. 139-116.200.
Smith, Darrell W.: *See*—
Hendrickson, Alfred A.; and Smith, Darrell W., 5,009,842, Cl. 419-28.000.
Smith, Franklin G., to Manufacturer's Consultants, Inc. Cord-type tire traction device. 5,009,256, Cl. 152-221.000.
Smith-Horn, Garry R.; and Wendt, Robert J., to General Motors Corporation. Vehicle door pivoted side glass. 5,009,461, Cl. 296-146.000.
Smith, Jack E., to General Motors Corporation. Strap wrench end attachment assembly for a twisted rope torsion bar. 5,009,405, Cl. 267-273.000.
Smith, James R.: *See*—
Holtan, Ramer B., Jr.; Falk, Kevin L.; Bergman, James F.; Smith, James R.; and Nelson, Kenneth E., 5,009,496, Cl. 351-156.000.
Smith, Lynn U.; and Merlino, Mario J., to Smith, Lynn U. Easy to fasten trousers. 5,008,962, Cl. 2-234.000.
Smith, Martin P.; and Saunders, Colin D., to Spandrel Establishment. Method of classifying objects according to shape. 5,010,247, Cl. 250-223.00R.
Smith, Peter R.: *See*—
Baker, Derrick J.; Bugden, Walter G.; and Smith, Peter R., 5,009,357, Cl. 228-122.000.
Smith, Raoul D., to Aeolian Partnership. Wind motor. 5,009,571, Cl. 416-79.000.
Smith, Richard L.: *See*—
Martin, Luther W.; and Smith, Richard L., 5,009,007, Cl. 30-92.000.
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Fry, John J.; Hall, George R., II; and Smith, Robert A., 5,010,322, Cl. 340-700.000.
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Shekleton, Jack R.; and Smith, Robert W., 5,009,589, Cl. 431-183.000.
Smith, Rodney B.: *See*—
Spehar, Eli G., 5,009,170, Cl. 108-36.000.
Smith, Ronald T.: *See*—
Shih, I-Fu; Chang, David B.; Arns, James A.; Moss, Gaylord E.; and Smith, Ronald T., 5,009,502, Cl. 356-152.000.
Smith, Russell G.: *See*—
Schramm, Laurier L.; and Smith, Russell G., 5,009,773, Cl. 208-391.000.
Smith, Sanford N., to Phillips Petroleum Company. Apparatus for separating elongated contaminants from a stream of material. 5,009,331, Cl. 209-615.000.
Smith, Stephen A.: *See*—
Markwell, Roger E.; Smith, Stephen A.; Hughes, Ian; and Gaster, Laramie M., 5,010,097, Cl. 514-419.000.
Smith, Thurman D.: *See*—
Richardson, David L.; Clark, Jack P.; Kowdley, Balasubramanian S.; Patterson, Peter M.; Perry, Richard W.; and Smith, Thurman D., 5,009,105, Cl. 73-621.000.
Smith, Timothy R., to Manville Corporation. Method and composition for filtering beer, ale or malt liquor to reduce multivalent metal cations. 5,009,906, Cl. 426-330.400.
Smiths Industries Medical Systems, Inc.: *See*—
Bell, Craig J., 5,009,850, Cl. 422-99.000.
Smiths Industries Public Limited Company: *See*—
Cross, David E.; Brooks, Kenneth J.; and Whiteside, Neil A., 5,009,647, Cl. 604-332.000.
Smithson, Joseph P. Enclosed yoke clasp for bola-style necktie. 5,008,981, Cl. 24-49.00R.
Snowden, Gregory O.; Barrett, Clifford E., III; and Gomez, Fernando, to Motorola, Inc. Paging system employing designated frame commencing information service data message transmission. 5,010,330, Cl. 340-825.210.
Soderberg, Per O., to Astra Meditec Aktiebolag. Device for fixing a dental prothesis. 5,009,596, Cl. 433-173.000.
Soderlund, Frits: *See*—
Carlsson, Anders; Johansson, Lars; and Soderlund, Frits, 5,009,583, Cl. 418-104.000.
Soga, Mamoru: *See*—
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Soga, Naohiro: *See*—
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Solco Basel AG: *See*—
Schmidt, Richard R.; Baer, Thomas; Zimmerman, Peter; and Wendel, Albrecht, 5,010,059, Cl. 514-25.000.
Solomon, Allen L., to Grumman Aerospace Corporation. Method of making trench JFET integrated circuit elements. 5,010,025, Cl. 437-29.000.
Solomon, Donald F. Reverse osmosis and hot water system. 5,009,777, Cl. 210-134.000.
Solomons, Clive C. Kit for determining blood platelet stress. 5,009,847, Cl. 422-61.000.

Solvent Services, Inc.: *See—*
Dieter, Douglas K., 5,009,266, Cl. 166-245.000.
Somar Corporation: *See—*
Maruyama, Hiroshi; Kiryu, Naohiko; Minezaki, Etsuko; Tagashira, Susumu; and Shimokawahara, Hisashi, 5,009,944, Cl. 428-40.000.
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Sony Corporation: *See—*
Fukushima, Hideo; and Kurushima, Masakazu, 5,010,432, Cl. 360-108.000.
Gomi, Takayuki, 5,010,026, Cl. 437-31.000.
Higuchi, Shigetaka; Noguchi, Isao; and Odashima, Tohru, 5,008,998, Cl. 29-840.000.
Malherbe, Bent, 5,008,993, Cl. 29-125.000.
Shimada, Satoshi; and Watanabe, Yuji, 5,010,411, Cl. 358-230.000.
Yoshida, Kimiyoshi; Sakano, Akio; Tamori, Hirofumi; and Chatani, Masayuki, 5,010,579, Cl. 382-13.000.
Soong, Tsai C. Sports racket. 5,009,422, Cl. 273-73.00D.
Soper, Daniel C.: *See—*
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Sorensen, Joseph A.; and Gatzemeyer, Dwight L., to Petersen Manufacturing Co., Inc. Quick-action bar clamp. 5,009,134, Cl. 81-487.000.
Sotton, Michel: *See—*
Gavet, Louis; Chatelin, Roger; Sotton, Michel; Guigal, Robert; and Laurent, Philippe, 5,009,846, Cl. 422-56.000.
Souders, Karen. Jewelry holder kit. 5,009,333, Cl. 211-13.000.
South Australian Co-Operative Bulk Handling Limited: *See—*
Johinke, Bruce L., 5,009,046, Cl. 52-197.000.
Spafax Holdings Plc.: *See—*
Robinson, Dennis W., 5,009,761, Cl. 204-192.140.
Spalding & Evenflo Companies, Inc.: *See—*
Stiefel, Joseph F.; Melvin, Terence; and Nesbitt, R. Dennis, 5,009,427, Cl. 273-232.000.
Spandrel Establishment: *See—*
Smith, Martin P.; and Saunders, Colin D., 5,010,247, Cl. 250-223.00R.
Sparton Corporation: *See—*
Merriam, David P.; Scott, Dale L.; and Scott, Bryan F., 5,010,568, Cl. 379-107.000.
Speck, Ulrich; and Roumeliotis, Panayiotis. Guar flour. 5,010,061, Cl. 514-54.000.
Spector, George: *See—*
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Spehar, Eli G., to Smith, Rodney B.; and Ostic, Ernest L. Portable body massage table. 5,009,170, Cl. 108-36.000.
Speranza, George P.; Lin, Jiang-Jen; and Cuscurida, Michael, to Texaco Inc. Process for preparing novel diamines. 5,010,160, Cl. 528-45.000.
Spielberger, Richard K.: *See—*
Dunaway, Thomas J.; Spielberger, Richard K.; Dicks, Lori A.; and Loy, Jerald M., 5,010,387, Cl. 357-70.000.
Spies, Alfons, to Dr. Johannes Heidenhain GmbH. Photoelectric position-measuring arrangement having a plurality of shiftable grids. 5,009,506, Cl. 356-356.000.
Spinos, Frank T.; and Worley, Sharon M. Beverage cooler. 5,009,083, Cl. 62-400.000.
Spitler, Wayne L., to General Motors Corporation. Clutch damper assembly. 5,009,301, Cl. 192-106.200.
Spitz, Robert A.; and Bricker, Mark, to East Penn Manufacturing Co., Inc. Process for the extended use of strip acid employed in the reclamation of battery acid fluid from expanded lead-acid batteries. 5,009,868, Cl. 423-139.000.
Spraggs, Richard W.: *See—*
Robins, Kendall H.; Austin, Dennis K.; and Spraggs, Richard W., 5,009,163, Cl. 102-301.000.
Springer, Hartmut; and Reiher, Uwe, to Hoechst Aktiengesellschaft. Water-soluble azo compounds having a N-(phenethyl)-amido-carbonyl-methoxyphenyl radical, substituted by a fiber-reactive group of the vinylsulfone series, suitable as fiber-reactive dyestuffs. 5,010,180, Cl. 534-638.000.
Sprintschnik, Gerhard; Niederstaetter, Walter; Reiss, Kurt; von Asten, Wolfgang; Scharf, Gunther; and Grzembra, Barbara, to Hoechst AG; and Vereinigte-Aluminum Werke A.G. Process for producing base material for an aluminum offset printing plate. 5,009,722, Cl. 148-2.000.
Square D Company: *See—*
Bartee, Edward C., 5,010,211, Cl. 174-48.000.
Brady, Peter J., 5,010,438, Cl. 361-56.000.
SSMC Inc.: *See—*
Sato, Shuichi; Koguchi, Yoshimi; and Kobayashi, Yoshiharu, 5,009,177, Cl. 112-292.000.
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Stafsudd, Oscar M.: *See—*
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Stahl, Steven B.: *See—*
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Stahl, Ted, to Stahls' Inc. Pre-sewn letter and method. 5,009,943, Cl. 428-40.000.
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Stahl, Ted, 5,009,943, Cl. 428-40.000.
Stankus, John C., to Jennmar Corporation. Expansion assembly for mine roof bolts. 5,009,549, Cl. 405-261.000.
Stanley Electric Co., Ltd.: *See—*
Ohmamyuda, Yukio; Tanabe, Toru; Matsumoto, Osamu; Suzuki, Hidenobu; and Jyouzuka, Masashi, 5,010,457, Cl. 362-66.000.
Starr, George N., to Delaware Capital Formation, Inc. Vehicle lift. 5,009,287, Cl. 187-8.410.
Stasch, Johannes-Peter: *See—*
Henning, Rolf; Benz, Gunter; Stasch, Johannes-Peter; Knorr, Andreas; and Bender, Wolfgang, 5,010,057, Cl. 514-018.000.
Staubli, Andrea: *See—*
Ron, Eyal; Staubli, Andrea; and Langer, Robert S., 5,010,167, Cl. 528-328.000.
Staudenraus, Joachim: *See—*
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Stavely, Donald J.: *See—*
Wanger, Mark E.; Methlie, Jennifer L.; Christie, Leslie G.; Dauner, Daniel R.; Domel, Douglas R.; Jones, David P.; Oliver, Thomas C.; and Stavely, Donald J., 5,010,536, Cl. 369-36.000.
Steck, Werner; Marosi, Laszlo; Haberkorn, Herbert; Feser, Rainer; Huebner, Werner; and Jakusch, Helmut, to BASF Aktiengesellschaft. Stabilization of acicular ferromagnetic chromium dioxide. 5,009,877, Cl. 423-607.000.
Steele, Douglas S., to General Electric Company. Ionization detector. 5,010,252, Cl. 250-385.100.
Steele, John; Johansen, Oddvar; Johnson, Graham; and Hodgkin, Johnathon, to Commonwealth Scientific & Industrial Research Organisation & Telectronics Pty. Limited. Material for cell attachment and growth. 5,010,009, Cl. 435-240.243.
Stehmeier, Heinz: *See—*
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Steiger, Ronald P.: *See—*
Leung, Peter K.; Steiger, Ronald P.; and Kunze, Kenneth R., 5,010,301, Cl. 324-376.000.
Steigerwald, Carl J., to Kendall Company, The. Valve assembly. 5,009,391, Cl. 251-149.100.
Steigerwald, Robert L., to General Electric Company. Lossless gate driver circuit for a high frequency converter. 5,010,261, Cl. 307-571.000.
Stein Industrie: *See—*
Bonnand, Christian; Mascart, Dominique; and Druelle, Philippe, 5,008,996, Cl. 29-727.000.
Stein, Matthew I., to Haws Company. Emergency wash station. 5,008,963, Cl. 4-620.000.
Steiner, Antoine: *See—*
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Steinike, Ulrich, to Ernst Jacobi & Co. KG. Cleaning device for textile machines disposed in a row. 5,008,972, Cl. 15-312.200.
Stenemann, Bruno: *See—*
Sacco, Bruno; Tomforde, Johann; Abb, Thomas; and Stenemann, Bruno, 5,009,042, Cl. 52-36.000.
Stengel, Philip B., to Creative Binding Systems, Inc. Booklet binding system. 5,009,537, Cl. 402-21.000.
Stenqvist, Jan N. Printing unit. 5,009,159, Cl. 101-351.000.
Stensio, Karl-Erland M.: *See—*
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Stephens, Robert S.: *See—*
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Sterk, Geert J.; Timmerman, Henk; and van der Goot, Henk, to Cedona Pharmaceuticals B.V. N-(W-substituted alkyl)-'-(imidazol-4-yl)alkyl)-guanidine. 5,010,095, Cl. 514-400.000.
Sterling Drug Inc.: *See—*
Lesher, George Y., deceased; Bacon, Edward R.; Singh, Baldev; and Kuo, Gee-Hong, 5,010,086, Cl. 514-303.000.
Stewart, Kenneth W., Sr., to United Technologies Electro Systems, Inc. Windshield wiper arm. 5,008,971, Cl. 15-250.200.
Stiefel, Joseph F.; Melvin, Terence; and Nesbitt, R. Dennis, to Spalding & Evenflo Companies, Inc. Golf ball. 5,009,427, Cl. 273-232.000.
Stimler, Jeffrey J.: *See—*
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Stingelin, Willy, to Ciba-Geigy Corporation. Cationic compounds. 5,010,190, Cl. 544-198.000.
Stinson, Robert A. Scraping tool. 5,009,009, Cl. 30-172.000.
Stoddard, Trenton D.: *See—*
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Stokbroekx, Raymond A.; Luyckx, Marcel G. M.; and Janssens, Frans E., to Janssen Pharmaceutica N.V. Intermediates for the synthesis of benzoxazol- and benzothiazolamine derivatives, useful as anti-anoxic agents. 5,010,198, Cl. 546-114.000.
Stokes, Barry O.; Bradshaw, Gary D.; and Barlow, Wayne K., to Wescor, Inc. Apparatus for applying a controlled amount of reagent to a microscope slide or the like. 5,009,185, Cl. 118-52.000.
Stolpe, Lars O.: *See—*
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Stone & Webster Engineering Corporation: *See—*
Goelzer, Alan R., 5,009,769, Cl. 208-113.000.
Stonehocker, Van T., to Coltec Industries Inc. Computer-based engine diagnostic method. 5,010,487, Cl. 364-424.030.
Storrow, Alan J.; and Knighton, Nigel J., to Radstone Technology Limited. Rack mounted circuit board. 5,010,444, Cl. 361-386.000.

Storz Medical AG: *See*—
Hagelauer, Ulrich, 5,009,682, Cl. 55-159.000.
Stover, Detlev; Buchkremer, Hans-Peter; and Hecker, Rudolf, to Forschungszentrum Julich GmbH. Process for joining workpieces of metal or ceramic by boundary surface diffusion. 5,009,359, Cl. 228-175.000.
Strandberg, Hans G., to Siemens Aktiengesellschaft. Oscillator having periodically pulsed crystal. 5,010,307, Cl. 331-116.0FE.
Streck, Donald A.; and Iggulden, Jerry R., to Light Ideas Incorporated. Constant-pressure, variable-volume irrigation sprinklers. 5,009,368, Cl. 239-70.000.
Streeter, Willie L. Microcomputer controlled rotation game. 5,009,419, Cl. 273-454.000.
Strenger, Heinrich: *See*—
Traubel, Harro; Strenger, Heinrich; Weber, Karl A.; Muller, Hans-Werner; Zapfel, Horst; and Hummel, Axel, 5,009,921, Cl. 427-31.000.
Stringer, Brian F.: *See*—
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Auld, John W.; Stringer, Brian F.; and Stringer, Brian F., 5,009,305, Cl. 198-395.000.
Stubbs, Jack B.: *See*—
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Stults, Robert A.: *See*—
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Subbotin, Anatoly N.: *See*—
Lipukhin, Jury V.; Danilov, Leonid I.; Ivoditov, Albert N.; Garber, Eduard A.; Subbotin, Anatoly N.; Pavlov, Valentin P.; Zhukov, Jury K.; and Pimenov, Alexandr F., 5,009,037, Cl. 51-7.000.
Sudo, Masamichi; and Okuda, Tamotsu, to Daikyo Gomu Seiko Ltd. Sliding stopper for a syringe. 5,009,646, Cl. 604-230.000.
Suen, Chih-Her: *See*—
Liang, Rong-Chang; Colyer, Emerson K.; Chen, Jing-Den; Kintz, Karl A.; and Suen, Chih-Her, 5,010,114, Cl. 521-109.100.
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Suganuma, Ryoichi, to Nikon Corporation. Driving device for ultrasonic wave motor. 5,010,222, Cl. 318-116.000.
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Sugimoto, Atsushi; Nakano, Osamu; Yasuda, Shigeru; Maeda, Chikatoshi; Ozone, Toshio; and Kawagoe, Makoto, to Aichi Steel Works, Ltd.; Toyota Jidosha Kabushiki Kaisha; and Chuo Hatsujo Kabushiki Kaisha. Spring steel having good durability and sag-resistance. 5,009,843, Cl. 420-112.000.
Sugiue, Shigeki: *See*—
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Suhonen, Christopher H., to Gillette Canada Inc. Aqueous stannous fluoride non-abrasive home treatment gel compositions. 5,009,883, Cl. 424-52.000.
Suhonen, Christopher H., to Gillette Canada Inc. Stabilized aqueous stannous fluoride mouthwash. 5,009,884, Cl. 424-52.000.
Sullivan Engine Works, Inc.: *See*—
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Sullivan, Robert W.; Holder, Tommie J.; and Buchanan, Max F., to Sullivan Engine Works, Inc. Rotary vee engine. 5,009,198, Cl. 123-43.00A.
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Sumitomo Electric Industries Ltd.: *See*—
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Shiga, Nobuo, 5,010,305, Cl. 330-277.000.
Sun, Shin-Ching. Purifying air conditioner. 5,009,683, Cl. 55-131.000.
Sunbeam Plastics Corporation: *See*—
Montgomery, Gary V.; and Beck, Terry E., 5,009,323, Cl. 215-252.000.
Sundstrand Corporation: *See*—
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Sung Ho Korea Company: *See*—
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Surguy, Paul W. H.: *See*—
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Suwabe, Shigekazu: *See*—
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Suzuki, Fumio; Kuroda, Takeshi; Nakasato, Yoshisuke; Ohmori, Kenji; and Manabe, Haruhiko, to Kyowa Hakko Kogyo Co., Ltd. Imidazoquinolone derivatives. 5,010,084, Cl. 514-293.000.
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Suzuki, Hideo: *See*—
Kosugi, Yoshitsugu; Tanaka, Hideoki; Suzuki, Hideo; and Shiraki, Masaru, 5,010,004, Cl. 435-134.000.
Suzuki, Hitoshi; Shiotani, Shinobu; Tokunaga, Shinji; Hirai, Tokuyuki; Fukumochi, Yoji; Kugimiya, Shuzo; and Sata, Ichiko, to Sharp Kabushiki Kaisha. System and method for language translation including replacement of a selected word for future translation. 5,010,486, Cl. 364-419.000.
Suzuki Jidosha Kogyo Kabushiki Kaisha: *See*—
Yuunaga, Toshifumi, 5,009,686, Cl. 55-419.000.
Suzuki, Kenichi: *See*—
Enari, Masahiko; Shikichi, Satoshi; Kawaguchi, Fumiaki; Suzuki, Kenichi; Usui, Masayuki; Matsuoka, Hiroshi; Matsuoka, Kazuhiko; Hosoya, Hideki; Aoki, Akio; and Minoura, Kazuo, 5,010,534, Cl. 369-32.000.
Suzuki, Koichi: *See*—
Harano, Takeshi; Takaki, Satoru; Shigesato, Yuzo; Suzuki, Koichi; Hashimoto, Naoki; Kojima, Hiroyasu; and Oyama, Takuji, 5,009,922, Cl. 427-37.000.
Suzuki, Makoto, to Brother Kogyo Kabushiki Kaisha. Image forming apparatus having switchable color separation filter units. 5,010,415, Cl. 358-302.000.
Suzuki, Tatsuya: *See*—
Kato, Rentaro; and Suzuki, Tatsuya, 5,009,403, Cl. 267-140.100.
Suzumura, Hirokazu: *See*—
Kuki, Nobuyuki; Isomura, Yukio; Suzumura, Hirokazu; Sakakibara, Yoshikazu; and Ishihara, Hiroshi, 5,009,035, Cl. 49-352.000.
Svenska Rotor Maskiner AB: *See*—
Carlsson, Anders; Johansson, Lars; and Soderlund, Frits, 5,009,583, Cl. 418-104.000.
Svenska Skatebox AB: *See*—
Lager, Kjell; Tarnstrom, Anders; Ostlund, Olov; and Driver, Joseph W., 5,009,039, Cl. 51-165.770.
Swanick, David J.: *See*—
Huntley, William P.; and Swanick, David J., 5,010,341, Cl. 342-20.000.
Swann, Peter R., to Gatan Incorporated. Chemically-assisted ion beam milling system for the preparation of transmission electron microscope specimens. 5,009,743, Cl. 156-643.000.
Swartz, Roy, to Delaware Investments Corp. Material handling system and control valve therefor. 5,009,551, Cl. 406-128.000.
Sweat, Bruce P.: *See*—
Lathom, Michael S.; Gullixson, Bruce B.; and Sweat, Bruce P., 5,010,279, Cl. 315-227.00R.
Sweeney, Harold E.: *See*—
Leonard, Donald A.; and Sweeney, Harold E., 5,009,500, Cl. 356-43.000.
Sy-Quest International Limited: *See*—
Newman, Jack; and Monroe, James A., 5,009,637, Cl. 604-68.000.
Sylvester, Richard J.: *See*—
Beattie, Patrick J.; Oliveri, Andrew L.; and Sylvester, Richard J., 5,009,090, Cl. 70-326.000.

Synfina-Oleofina: *See—*
Prieels, Jean-Paul; Maschelein, Charles; and Heilporn, Marc, 5,010,007, Cl. 435-190.000.
Syntex Pharmaceuticals Ltd.: *See—*
Pascal, Jean C.; Lee, Chi-Ho; Alps, Brian J.; Pinhas, Henri; and Whiting, Roger L., 5,010,075, Cl. 514-218.000.
Synthelabo: *See—*
Manoury, Philippe; Binet, Jean; Obitz, Daniel; Defosse, Gerard; Dewitte, Elisabeth; and Veronique, Corinne, 5,010,079, Cl. 514-253.000.
Syntro Corporation: *See—*
Pollock, Thomas J., 5,010,001, Cl. 435-69.100.
Syrinek, Allen R.; Buggs, Ralph N.; and Gabel, Robert K., to Nalco Chemical Company. Inorganic acid solution viscosifier and corrosion inhibitor and method. 5,009,799, Cl. 252-8.553.
Tabuchi, Toyoji: *See—*
Hikita, Mitsutaka; Sumioka, Atsushi; Tabuchi, Toyoji; Kurosawa, Kazuhito; and Kinoshita, Tuneo, 5,010,269, Cl. 310-313.00B.
Tagashira, Susumu: *See—*
Maruyama, Hiroshi; Kiryu, Naohiko; Minezaki, Etsuko; Tagashira, Susumu; and Shimokawahara, Hisashi, 5,009,944, Cl. 428-40.000.
Tagawa, Koichi, to Maeda Industries, Ltd. Shift lever assembly for bicycle. 5,009,629, Cl. 474-80.000.
Taguchi, Akira; Morita, Shigetoshi; Taka, Shunichi; Yamada, Hirohide; Takada, Yoshiaki; Furuichi, Shinji; and Ao, Masahiro, to Hitachi Metals, Ltd. Floating magnetic head having improved static friction coefficient. 5,010,429, Cl. 360-103.000.
Taguchi, Katsuhiko; and Mitsumori, Kazuya, to Juki Corporation. Apparatus for positioning a magnetic disk on a disk drive. 5,010,427, Cl. 360-99.050.
Taiyo Ink Manufacturing Co., Ltd.: *See—*
Kamayachi, Yuichi; and Inagaki, Syoji, 5,009,982, Cl. 430-280.000.
Taiyo Yuden Co., Ltd.: *See—*
Arai, Yuji; Shin, Yuaki; Ishiguro, Takashi; and Hamada, Emiko, 5,009,818, Cl. 264-1.003.
Hayashi, Yutaka; Itoh, Atuo; Imai, Mizuho; and Iida, Hideyo, 5,009,928, Cl. 427-126.300.
Taka, Shunichi: *See—*
Taguchi, Akira; Morita, Shigetoshi; Taka, Shunichi; Yamada, Hirohide; Takada, Yoshiaki; Furuichi, Shinji; and Ao, Masahiro, 5,010,429, Cl. 360-103.000.
Takada, Hirohisa, to Fuji Jukogyo Kabushiki Kaisha. Anti-frost system for a windshield of a motor vehicle. 5,010,289, Cl. 322-8.000.
Takada, Yoshiaki: *See—*
Taguchi, Akira; Morita, Shigetoshi; Taka, Shunichi; Yamada, Hirohide; Takada, Yoshiaki; Furuichi, Shinji; and Ao, Masahiro, 5,010,429, Cl. 360-103.000.
Takada, Yoshinao: *See—*
Yamada, Takehito; Tanimoto, Kazushi; Sakai, Yuji; Muraoka, Takao; Inoue, Tetsuo; and Takada, Yoshinao, 5,010,430, Cl. 360-103.000.
Takahashi, Koji: *See—*
Yasumura, Hiroto; Hirasawa, Masahide; Noji, Minoru; Kozuki, Susumu; Takahashi, Koji; and Yoshimura, Katsuji, 5,010,416, Cl. 358-314.000.
Takahashi, Nobuyuki, to Akebono Brake Industry Co., Ltd.; and Akebono Research and Development Centre Ltd. Disc brake apparatus. 5,009,293, Cl. 188-72.400.
Takahashi, Osamu: *See—*
Aoki, Kozo; and Takahashi, Osamu, 5,009,989, Cl. 430-512.000.
Takahashi, Toshio: *See—*
Kanehira, Makoto; Nakagawa, Takerou; Tsubakimoto, Yasumasa; Tanaka, Kouji; Takahashi, Toshio; and Ikeda, Masaaki, 5,009,630, Cl. 474-211.000.
Takahiro, Syuji: *See—*
Yoshida, Keiji; Funato, Ryo; Takahiro, Syuji; Kubo, Shinji; and Inagaki, Notoshi, 5,009,978, Cl. 430-109.000.
Takajo, Toshimi; Asai, Hiromitsu; and Haginuma, Kiyoshi, to Nippon Seiko Kabushiki Kaisha. Dynamic pressure type bearing and spindle unit. 5,009,520, Cl. 384-100.000.
Takaki, Satoru: *See—*
Harano, Takeshi; Takaki, Satoru; Shigesato, Yuzo; Suzuki, Koichi; Hashimoto, Naoki; Kojima, Hiroyasu; and Oyama, Takuji, 5,009,922, Cl. 427-37.000.
Takaki, Satoshi: *See—*
Echizen, Hiroshi; and Takaki, Satoshi, 5,010,276, Cl. 315-111.210.
Takakura, Shinichi: *See—*
Mandai, Harufumi; Tanaka, Yukio; Takakura, Shinichi; and Nakagawa, Takuji, 5,009,744, Cl. 156-656.000.
Takamatsu, Osamu: *See—*
Eguchi, Ken; Kawada, Haruki; Sakai, Kunihiro; Tomida, Yoshinori; Matsuda, Hiroshi; Tsuboyama, Akira; Takimoto, Kiyoshi; and Takamatsu, Osamu, 5,009,489, Cl. 350-341.000.
Takano, Haruhiro, to Yokohama Rubber Co., Ltd., The. Rubber compositions for tire inner liners. 5,010,142, Cl. 525-332.400.
Takashima, Masaaki: *See—*
Umeda, Itsuki; Takashima, Masaaki; Zama, Yoshiaki; Takemura, Yasuhiko; Funabashi, Yuichi; Watanabe, Junichiro; Takeda, Kiyoshi; and Matsumoto, Makoto, 5,010,137, Cl. 525-104.000.
Takayama, Naoto, to Fuji Photo Film Co., Ltd. Apparatus for incorporating lock plates in video cassettes. 5,010,436, Cl. 360-137.000.
Takayama, Tsutomu: *See—*
Kinoshita, Takao; Tojo, Akihiko; Takayama, Tsutomu; Kaji, Toshio; and Tanaka, Nobuyoshi, 5,010,418, Cl. 358-335.000.
Takeda, Kiyoshi: *See—*
Umeda, Itsuki; Takashima, Masaaki; Zama, Yoshiaki; Takemura, Yasuhiko; Funabashi, Yuichi; Watanabe, Junichiro; Takeda, Kiyoshi; and Matsumoto, Makoto, 5,010,137, Cl. 525-104.000.
Takeda, Takayuki; and Satoh, Masayasu, to Oki Electric Industry Co., Ltd. Focus servo apparatus. 5,010,538, Cl. 369-44.360.
Takegami, Kiyoyoshi: *See—*
Endo, Mineyo; Takegami, Kiyoyoshi; Hishida, Noriaki; and Miyaji, Itsuo, 5,009,436, Cl. 277-80.000.
Takeguchi, Shunsuke: *See—*
Hiraoka, Takeshi; Takeguchi, Shunsuke; and Kawai, Satoshi, 5,009,123, Cl. 74-567.000.
Takei, Katsumori; Fukushima, Hitoshi; Iwamoto, Kohei; and Nakamura, Hiroto, to Seiko Epson Corporation. Thermal transfer ink printing apparatus. 5,010,352, Cl. 346-76.0PH.
Takemura, Yasuhiko: *See—*
Umeda, Itsuki; Takashima, Masaaki; Zama, Yoshiaki; Takemura, Yasuhiko; Funabashi, Yuichi; Watanabe, Junichiro; Takeda, Kiyoshi; and Matsumoto, Makoto, 5,010,137, Cl. 525-104.000.
Takenaka, Kohei: *See—*
Shiokawa, Youichi; Takimoto, Koichi; and Takenaka, Kohei, 5,010,093, Cl. 514-374.000.
Takenaka Komuten Company, Ltd.: *See—*
Sakuta, Masaharu; Urano, Toshiharu; Tanaka, Kyoichi; Sugiyama, Masashi; Endoh, Shyuzo; and Fujioka, Keisuke, 5,009,713, Cl. 106-727.000.
Takesue, Toshihiro: *See—*
Murahashi, Takashi; Nakazawa, Toshihiko; Takesue, Toshihiro; and Motoi, Toshihiro, 5,010,353, Cl. 346-108.000.
Takeuchi, Hisao: *See—*
Sasame, Akira; Sakanoue, Hitoyuki; Takeuchi, Hisao; Miyake, Masaya; Yamakawa, Akira; Yushio, Yasuhisa; and Akazawa, Hitoshi, 5,010,388, Cl. 357-70.000.
Takeuchi, Kenji; Gagnon, Andre F.; Cheung, Augustine C.; and Meyer, Philip E., to Westinghouse Electric Corp. Expert system for surveillance, diagnosis and prognosis of plant operation. 5,009,833, Cl. 376-217.000.
Takeuchi, Kikuko: *See—*
Nakamura, Tomio; Shimizu, Shigeru; and Takeuchi, Kikuko, 5,009,811, Cl. 252-500.000.
Takeuchi, Masahiko: *See—*
Sato, Kazuhiro; Kishi, Tomomi; Umeda, Koji; Uchida, Yasuhi; and Takeuchi, Masahiko, 5,010,226, Cl. 219-81.000.
Takeuchi, Ryoji, to Kabushiki Kaisha Toshiba. Apparatus having a movable portion and a fixed portion for reproducing data from an optical disk by a light beam. 5,010,541, Cl. 369-107.000.
Takeuchi, Tatsuo; and Amemiya, Koji, to Canon Kabushiki Kaisha. Transparent film and color image forming method. 5,009,945, Cl. 428-76.000.
Takeuchi, Yoshiaki: *See—*
Sasaki, Hiroyuki; Shimamura, Masato; Noda, Juichi; Hanafusa, Hiroaki; and Takeuchi, Yoshiaki, 5,009,478, Cl. 350-96.150.
Takimoto, Kiyoshi: *See—*
Eguchi, Ken; Kawada, Haruki; Sakai, Kunihiro; Tomida, Yoshinori; Matsuda, Hiroshi; Tsuboyama, Akira; Takimoto, Kiyoshi; and Takamatsu, Osamu, 5,009,489, Cl. 350-341.000.
Takimoto, Koichi: *See—*
Shiokawa, Youichi; Takimoto, Koichi; and Takenaka, Kohei, 5,010,093, Cl. 514-374.000.
Takushima, Akiro: *See—*
Tanaka, Syozo; Takushima, Akiro; Shinobu, Yoshiharu; and Eguchi, Masaki, 5,009,084, Cl. 62-441.000.
Talcott, James G. Wear resistant grain flow control elbow. 5,009,552, Cl. 406-193.000.
Tamagnone, Gianfranco: *See—*
Piani, Silvano; Tamagnone, Gianfranco; Alpino, Raul R.; Milani, Maria R.; and Fantuz, Marinella, 5,010,063, Cl. 514-56.000.
Tamahoko, Tetsuya: *See—*
Ohkawa, Osamu; Tamahoko, Tetsuya; and Imanage, Eisuke, 5,009,296, Cl. 192-20.000.
Tamari, Kousaku; and Katamoto, Tsutomu, to Toda Kogyo Corp. Non-magnetic pigments. 5,009,712, Cl. 106-456.000.
Tamori, Hirofumi: *See—*
Yoshida, Kimiyoshi; Sakano, Akio; Tamori, Hirofumi; and Chatani, Masayuki, 5,010,579, Cl. 382-13.000.
Tanaami, Toshiyasu: *See—*
Kamishioiri, Nobuyuki; Kaneda, Manabu; Tanaami, Toshiyasu; and Maeda, Miho, 5,009,651, Cl. 604-378.000.
Tanabe, Hideo: *See—*
Kitada, Masahiro; Shimizu, Noboru; Tanabe, Hideo; and Nakamura, Hitoshi, 5,010,433, Cl. 360-113.000.
Tanabe, Toru: *See—*
Ohmamyuda, Yukio; Tanabe, Toru; Matsumoto, Osamu; Suzuki, Hidenobu; and Jyouzuka, Masashi, 5,010,457, Cl. 362-66.000.
Tanaka, Hideoki: *See—*
Kosugi, Yoshitsugu; Tanaka, Hideoki; Suzuki, Hideo; and Shiraki, Masaru, 5,010,004, Cl. 435-134.000.
Tanaka, Kazuyuki; Iwami, Etsuji; Matsuzawa, Jun; Mukoyama, Yoshiyuki; Shibata, Noriohiko; Hanawa, Akinori; and Yokota, Mitsuo, to Hitachi Chemical Company, Ltd. Resin composition and electrical laminate obtained therefrom. 5,009,949, Cl. 428-260.000.
Tanaka, Kouji: *See—*
Kanehira, Makoto; Nakagawa, Takerou; Tsubakimoto, Yasumasa; Tanaka, Kouji; Takahashi, Toshio; and Ikeda, Masaaki, 5,009,630, Cl. 474-211.000.

Tanaka, Kyoichi: *See—*
Sakuta, Masaharu; Urano, Toshiharu; Tanaka, Kyoichi; Sugiyama, Masashi; Endoh, Shyuzo; and Fujioka, Keisuke, 5,009,713, Cl. 106-727.000.

Tanaka, Motonao: *See—*
Ohtsuki, Shigeo; and Tanaka, Motonao, 5,010,528, Cl. 367-90.000.

Tanaka, Nobuyoshi: *See—*
Kinoshita, Takao; Tojo, Akihiko; Takayama, Tsutomu; Kaji, Toshio; and Tanaka, Nobuyoshi, 5,010,418, Cl. 358-335.000.

Tanaka, Shigeru, to Kabushiki Kaisha Toshiba. Plastic-molded semiconductor device. 5,010,390, Cl. 357-72.000.

Tanaka, Syozo; Takushima, Akiro; Shinobu, Yoshiharu; and Eguchi, Masaki, to Sharp Kabushiki Kaisha. Refrigerator. 5,009,084, Cl. 62-441.000.

Tanaka, Takao; and Odahara, Kazuhiro, to Mitsubishi Denki Kabushiki Kaisha. Moisture drain bush for an engine starter motor. 5,010,265, Cl. 310-88.000.

Tanaka, Teruo: *See—*
Omoda, Koichiro; Tanaka, Teruo; Nakagoshi, Junji; Hamanaka, Naoki; and Nagashima, Shigeo, 5,010,477, Cl. 364-200.000.

Tanaka, Yukio: *See—*
Mandai, Harufumi; Tanaka, Yukio; Takakura, Shinichi; and Nakagawa, Takuji, 5,009,744, Cl. 156-656.000.

Tandy Electronics Japan Ltd.: *See—*
Tsushima, Masayuki, 5,010,567, Cl. 379-77.000.

Tang, Kuo-Chang: *See—*
Buxton, Galina P.; and Tang, Kuo-Chang, 5,009,979, Cl. 430-110.000.

Tang, Thomas E.; Wei, Che-Chia; Haken, Roger A.; and Chapman, Richard A., to Texas Instruments Incorporated. Process for making CMOS device with both P+ and N+ gates including refractory metal silicide and nitride interconnects. 5,010,032, Cl. 437-57.000.

Tanigawa, Shu: *See—*
Okada, Kenichi; Nishino, Masashi; and Tanigawa, Shu, 5,009,480, Cl. 350-96.150.

Taniguchi, Haruyuki: *See—*
Kijima, Takao; Edahiro, Takeshi; Koyama, Toshihide; and Taniguchi, Haruyuki, 5,009,448, Cl. 280-673.000.

Tanikawa, Hirohide: *See—*
Yoshida, Satoshi; Nakahara, Toshiaki; Tanikawa, Hirohide; and Sakashita, Kiichiro, 5,009,973, Cl. 430-45.000.

Tanimoto, Kazushi: *See—*
Yamada, Takehito; Tanimoto, Kazushi; Sakai, Yuji; Muraoka, Takao; Inoue, Tetsuo; and Takada, Yoshinao, 5,010,430, Cl. 360-103.000.

Tanimoto, Yoshio: *See—*
Yamane, Takakazu; Tanimoto, Yoshio; and Nakahama, Tadamitsu, 5,009,931, Cl. 427-195.000.

Tannhof, Pascal: *See—*
Boudon, Gerard; Mollier, Pierre; Nuez, Jean-Paul; Ong, Ieng; Tannhof, Pascal; and Wallart, Franck, 5,010,257, Cl. 307-446.000.

Tapco Products Company, Inc.: *See—*
MacLeod, Richard J.; Chubb, Norman L.; and Schiedegger, Charles E., 5,009,149, Cl. 98-42.210.

Tarnstrom, Anders: *See—*
Lager, Kjell; Tarnstrom, Anders; Ostlund, Olov; and Driver, Joseph W., 5,009,039, Cl. 51-165.770.

Tarozzi, Richard A.: *See—*
Silver, Jules; and Tarozzi, Richard A., 5,009,645, Cl. 604-207.000.

Tarquini, Michael A.: *See—*
Kosin, John A.; Mooney, Gerry; Tarquini, Michael A.; and Garcia, Rod A., 5,009,809, Cl. 252-350.000.

Tarquini, Michael E.: *See—*
Wason, Satish K.; Mooney, Gerry; Andrews, Claude R.; Tarquini, Michael E.; Kosin, John A.; and Garcia, Rod A., 5,009,810, Cl. 252-350.000.

Tassel, Robert A. V.: *See—*
Hamlin, Robert N.; Shockey, Rick L.; and Tassel, Robert A. V., 5,009,659, Cl. 606-159.000.

Tatsumi, Yuuichi: *See—*
Minagawa, Hidenobu; Tatsumi, Yuuichi; Iwahashi, Hiroshi; Asano, Masamichi; Nakai, Hiroto; and Imai, Mizuho, 5,010,520, Cl. 365-174.000.

Tatum, David M. Sealing assembly for relatively movable members. 5,009,519, Cl. 384-94.000.

Taylor, Brooks W.; and Walsh, Thomas E., to Vari-Lite, Inc. Console/-lamp unit coordination and communication in lighting systems. 5,010,459, Cl. 362-85.000.

Taylor, Fletcher B., Jr.; and Esmon, Charles T., to Oklahoma Medical Research Foundation. Treatment of dysfunctional vascular endothelium using activated protein C. 5,009,889, Cl. 424-94.640.

Taylor, Geoffrey W.: *See—*
Cooke, Paul W.; and Taylor, Geoffrey W., 5,010,374, Cl. 357-16.000.

Taylor, Richard C.: *See—*
Biasillo, Alberto; and Taylor, Richard C., 5,010,491, Cl. 364-474.280.

Taylor, Wayne: *See—*
Hardin, Paul W., Jr.; and Taylor, Wayne, 5,009,542, Cl. 404-6.000.

TDK Corporation: *See—*
Shiba, Haruo; Ikebe, Masaru; and Ishida, Toshihiko, 5,010,435, Cl. 360-133.000.

TEAC Corporation: *See—*
Tsuyuguchi, Hiroshi; Noda, Yasushi; Morita, Tsutomu; and Shimozawa, Kenji, 5,010,246, Cl. 250-216.000.

Tecnol, Inc.: *See—*
Hubbard, Vance M.; and Brunson, Welton K., 5,008,961, Cl. 2-195.000.

Teijin Limited: *See—*
Kawaguchi, Takayuki; Shiro, Takashi; Iwata, Kaoru; and Daido, Takahiro, 5,009,986, Cl. 430-495.000.

Teixeira, Barbara J.: *See—*
Chariton, Zhenia J.; and Teixeira, Barbara J., 5,009,361, Cl. 229-1.50R.

Tejima, Kunisuke: *See—*
Hayase, Isao; and Tejima, Kunisuke, 5,009,577, Cl. 417-295.000.

Tektronix, Inc.: *See—*
Wardzala, Edward D., 5,010,403, Cl. 358-139.000.

Telefonaktiebolaget L M Ericsson: *See—*
Eklund, Hans A., 5,010,587, Cl. 455-618.000.

Telep, Robert J.: *See—*
Kline, Loren H.; Sherwin, Harry A.; and Telep, Robert J., 5,009,250, Cl. 137-596.170.

Temelli, Sedat, to Mullverbrennungsanlage Wuppertal GmbH. Apparatus for incineration of refuse. 5,009,173, Cl. 110-244.000.

Temperature Engineering Corp.: *See—*
Winslow, James G., 5,009,076, Cl. 62-129.000.

Terasaka, Katsunori: *See—*
Nakagawa, Toyoaki; Sanbuichi, Hiroshi; Terasaka, Katsunori; and Saito, Makoto, 5,009,210, Cl. 123-489.000.

Terashima, Shigeo; Tsuji, Kentaro; and Fuji, Hiroshi, to Sharp Kabushiki Kaisha. Optical disk device for storing both analog and discrete data and which utilizes both CLV and CAV techniques. 5,010,539, Cl. 369-50.000.

Terashima, Shigeo: *See—*
Fuji, Hiroshi; Fujiwara, Tsuneo; Iwaki, Takashi; Numata, Tomiyuki; Tsuji, Kentaroh; Maeda, Shigemi; Yamaguchi, Takeshi; Kojima, Kunio; Deguchi, Toshihisa; and Terashima, Shigeo, 5,010,540, Cl. 369-50.000.

Tessaro, John E., to Westinghouse Electric Corp. Curvilinear translating latch and linkage arrangement in a control rod drive mechanism of a nuclear reactor. 5,009,834, Cl. 376-232.000.

Tetra Pak Holdings & Finance S.A.: *See—*
Hanerus, Goran; and Ljungstrom, Tommy, 5,009,339, Cl. 222-1.000.

Texaco Inc.: *See—*
Bartels, Craig R., 5,009,783, Cl. 210-500.410.
Kalfoglou, George, 5,009,268, Cl. 166-274.000.
Speranza, George P.; Lin, Jiang-Jen; and Cuscurida, Michael, 5,010,160, Cl. 528-45.000.

Texas Instruments Incorporated: *See—*
Ashmore, Benjamin H., Jr., 5,010,522, Cl. 365-189.070.
Douglas, Monte A., 5,010,378, Cl. 357-23.600.
Gill, Manzur; and Lin, Sung-Wei, 5,010,028, Cl. 437-43.000.
Groover, Robert, III, 5,010,386, Cl. 357-42.000.
Norwood, Roger D.; and Kersh, David V., III, 5,010,260, Cl. 307-482.100.
Oates, Martin, 5,010,516, Cl. 365-49.000.
Reid, Lee R.; and Yuan, Han-Tzong, 5,009,476, Cl. 350-96.110.
Tang, Thomas E.; Wei, Che-Chia; Haken, Roger A.; and Chapman, Richard A., 5,010,032, Cl. 437-57.000.
Wallace, James S., 5,010,447, Cl. 361-400.000.

Texo Corporation: *See—*
Wagner, Steven D., 5,010,131, Cl. 524-457.000.

Th. Kieserling & Albrecht GmbH & Co., Werkzeugmaschinenfabrik: *See—*
Glomb, Reiner; Maresch, Peter; and Wagner, Ralf, 5,009,136, Cl. 82-127.000.

Therond, Michel, to Manufacture d'Appareillage Electrique de Cahors. Method of making an insulating support arm for an electric line pole. 5,009,734, Cl. 156-184.000.

Thiele, Robert E.: *See—*
Roller, Timothy J.; and Thiele, Robert E., 5,009,470, Cl. 312-325.000.

Thierauch, Karl-Heinz: *See—*
Skuballa, Werner; Dahl, Helmut; Vorbrueggen, Helmut; Loge, Olaf; and Thierauch, Karl-Heinz, 5,010,065, Cl. 514-58.000.

Thomas, Albert V.: *See—*
Ronsen, Bruce; Arora, Sudershan K.; and Thomas, Albert V., 5,010,058, Cl. 514-23.000.

Thomas, Brian J., to Welch Allyn, Inc. Assembly for a D.C. HID lamp. 5,009,617, Cl. 439-679.000.

Thomas, Gareth J.: *See—*
Lambert, Robert W.; Martin, Joseph A.; and Thomas, Gareth J., 5,010,060, Cl. 514-49.000.

Thomas, Howard C., to Eureka X-Ray Tube, Inc. Dual axis translation mechanism. 5,010,564, Cl. 378-176.000.

Thomas, Ronald: *See—*
West, Paul; Hovsepian, Mirik; and Thomas, Ronald, 5,009,111, Cl. 73-862.610.

Thometzek, Peter: *See—*
De Cleyn, Rene ; Thometzek, Peter; and Rademachers, Jakob, 5,009,879, Cl. 423-610.000.

Thompson, Allister W. Zipper securing device. 5,008,985, Cl. 24-370.000.

Thompson, Frederick H.: *See—*
Beaurepaire, Olivier; and Thompson, Frederick H., 5,009,124, Cl. 74-595.000.

Thompson, John H.: *See—*
Skinner, Dale D.; and Thompson, John H., 5,010,525, Cl. 367-13.000.

Thomson-CSF: *See*—
Arditty, Herve ; and Lefevre, Hevre , 5,009,504, Cl. 356-350.000.
Dias, Bernard; and du Chene, Arnaud, 5,010,552, Cl. 371-27.000.
Vermersch, Alain, 5,010,273, Cl. 315-39.610.
Thoraval, Dominique; and Bovenkamp, John W., to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence. Chemical agent detectors for chemical nerve agents. 5,009,845, Cl. 422-56.000.
Thorn EMI plc: *See*—
Morris, Christopher J.; Coulson, Ian; and Surguy, Paul W. H., 5,010,328, Cl. 340-784.000.
Phillips, Geoffrey J.; and George, Kevin F., 5,010,274, Cl. 315-101.000.
Thuemling, Evelyn: *See*—
Diebel, Heinz; Peterhoff, Ralf; and Thuemling, Evelyn, 5,010,502, Cl. 364-522.000.
Thurston, Kurt W. Plastic barricade with limiting bolt. 5,009,541, Cl. 404-6.000.
Thurston, William E.: *See*—
Langgard, Ulf R.; and Thurston, William E., 5,009,613, Cl. 439-482.000.
Tibbling, Lars: *See*—
Gersten, Martin; Tibbling, Lars; and Maus, Roy, 5,009,498, Cl. 351-212.000.
Tickner, Robert H.: *See*—
Keller, John A.; Traylor, Barry S.; and Tickner, Robert H., 5,010,482, Cl. 364-200.000.
Tikhonova, Tatyana S.: *See*—
Fedin, Marat A.; Kuznetsova, Tatyana A.; Lysenkov, Viktor I.; Novikova, Svetlana A.; Savchuk, Valentin A.; Sedelnikov, Anatoly I.; Shabunya, Vera P.; Udarov, Boris G.; Tikhonova, Tatyana S.; Polyakova, Nina P.; and Paklin, Sergei I., 5,010,106, Cl. 514-546.000.
Tikhy, Viktor G.: *See*—
Paton, Boris E.; Utkin,-Vladimir F.; Nedoseka, Anatoly Y.; Khromyak, Nikolai T.; Gorlitsyn, Nikolai V.; Tikhy, Viktor G.; Mezintsev, Evgeny D.; and Mezhuev, Nikolai N., 5,010,503, Cl. 364-569.000.
Timken Company, The: *See*—
Folger, Russell F.; and Fox, Gerald P., 5,009,523, Cl. 384-475.000.
Timmerman, Henk: *See*—
Sterk, Geert J.; Timmerman, Henk; and van der Goot, Henk, 5,010,095, Cl. 514-400.000.
Titan Linkabit Corporation: *See*—
Katznelson, Ron D., 5,010,571, Cl. 380-4.000.
Tobita, Toshimitsu: *See*—
Yoneda, Kenzi; Ueshima, Takaaki; Kuzunuki, Soshiro; Morita, Yuzo; and Tobita, Toshimitsu, 5,010,472, Cl. 364-148.000.
Tocco, Inc.: *See*—
Pfaffmann, George D., 5,009,395, Cl. 266-92.000.
Toda, Haruki, to Kabushiki Kaisha Toshiba. Semiconductor memory device. 5,010,518, Cl. 365-145.000.
Toda Kogyo Corp.: *See*—
Tamari, Kousaku; and Katamoto, Tsutomu, 5,009,712, Cl. 106-456.000.
Todd, Thomas W. Soldering apparatus and method of using the same. 5,010,227, Cl. 219-85.160.
Toft, Lonnie P. Ski board binding. 5,009,441, Cl. 280-14.200.
Tojo, Akihiko: *See*—
Kinoshita, Takao; Tojo, Akihiko; Takayama, Tsutomu; Kaji, Toshio; and Tanaka, Nobuyoshi, 5,010,418, Cl. 358-335.000.
Tokai Rubber Industries, Ltd.: *See*—
Hirazawa, Nobuhiro, 5,009,404, Cl. 267-140.100.
Kato, Rentaro; and Suzuki, Tatsuya, 5,009,403, Cl. 267-140.100.
Tokiwa, Yukio; Ichikawa, Fumitoshi; Nakamura, Naomi; Hirose, Syunichi; and Inokuchi, Haruhisa, to Tokyo Electric Power Co., Inc., The; and Kabushiki Kaisha Toshiba. Control apparatus of DC power coupling system. 5,010,467, Cl. 363-37.000.
Tokunaga, Hiroyuki; Yamagata, Kenji; and Yonehara, Takao, to Canon Kabushiki Kaisha. Process for producing compound semiconductor using an amorphous nucleation site. 5,010,033, Cl. 437-83.000.
Tokunaga, Shinji: *See*—
Suzuki, Hitoshi; Shiotani, Shinobu; Tokunaga, Shinji; Hirai, Tokuyuki; Fukumochi, Yoji; Kugimiya, Shuzo; and Sata, Ichiko, 5,010,486, Cl. 364-419.000.
Tokyo Electric Co., Ltd.: *See*—
Horii, Masami; Komakine, Shigeo; Ochiai, Kuniaki; and Kondoh, Takashi, 5,009,528, Cl. 400-124.000.
Koike, Seiji, 5,009,531, Cl. 400-240.300.
Tokyo Electric Power Co., Inc., The: *See*—
Tokiwa, Yukio; Ichikawa, Fumitoshi; Nakamura, Naomi; Hirose, Syunichi; and Inokuchi, Haruhisa, 5,010,467, Cl. 363-37.000.
Tokyo Keiki Co., Ltd.: *See*—
Sato, Izumi; Saito, Koji; and Inoue, Takashi, 5,009,103, Cl. 73-597.000.
Tokyo Seat Co., Ltd.: *See*—
Ohkawa, Osamu; Tamahoko, Tetsuya; and Imanage, Eisuke, 5,009,296, Cl. 192-20.000.
Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Masasumi, Yana; Hitoshi, Nagato; Kiyoshi, Yamada; Shyoji, Ueno; and Kunihiro, Shibuya, 5,009,527, Cl. 400-120.000.
Tomczuk, Zygmunt; Miller, William E.; Wolson, Raymond D.; and Gay, Eddie C., to United States of America, Energy. Process and apparatus for recovery of fissionable materials from spent reactor fuel by anodic dissolution. 5,009,752, Cl. 204-64.00R.
Tomforde, Johann: *See*—
Sacco, Bruno; Tomforde, Johann; Abb, Thomas; and Stenemann, Bruno, 5,009,042, Cl. 52-36.000.
Tomida, Yoshinori: *See*—
Eguchi, Ken; Kawada, Haruki; Sakai, Kunihiro; Tomida, Yoshinori; Matsuda, Hiroshi; Tsuboyama, Akira; Takimoto, Kiyoshi; and Takamatsu, Osamu, 5,009,489, Cl. 350-341.000.
Tomita, Kunikazu: *See*—
Nishimoto, Akihiko; Hosoya, Yoshihiro; Tomita, Kunikazu; Urabe, Toshiaki; and Jitsukawa, Masaharu, 5,009,726, Cl. 148-111.000.
Tomita, Seisuke: *See*—
Yamagishi, Hisashi; Kakiuchi, Shinichi; and Tomita, Seisuke, 5,009,428, Cl. 273-232.000.
Tomotsu, Norio, to Idemitsu Petrochemical Co., Ltd. Method for preparing ethylene polymers. 5,010,151, Cl. 526-105.000.
Toohey, William J., to Eastman Kodak Company. Doubly correlated sample and hold circuit. 5,010,408, Cl. 358-213.110.
Topalian, Harry H.: *See*—
Saslaw, Irving M.; Topalian, Harry H.; and Rispoli, Joseph M., 5,009,904, Cl. 426-243.000.
Topert, Michael: *See*—
Bittler, Dieter; Laurent, Henry; Rach, Petra; and Topert, Michael, 5,010,071, Cl. 514-178.000.
Topfl, Rosemarie: *See*—
Berendt, Hans-Ulrich; and Topfl, Rosemarie, 5,009,668, Cl. 8-557.000.
Toppan Moore Company, Ltd.: *See*—
Moriwaki, Masafumi; Sano, Shigeaki; Hatakeyama, Katsunori; Yamada, Hiroshi; and Nouno, Youzou, 5,010,213, Cl. 178-18.000.
Tops e, Haldor F. A.: *See*—
Johansen, Keld; Pedersen, Erik; and Tops e, Haldor F. A., 5,010,054, Cl. 505-1.000.
Torborg, John G., Jr., to Raster Technologies, Inc. Parallel graphics processor with workload distributing and dependency mechanisms and method for distributing workload. 5,010,515, Cl. 364-900.000.
Toriello, Lawrence I.: *See*—
Cleary, Terrance M.; Donahue, Raymond J.; Hesterberg, William G.; and Toriello, Lawrence I., 5,009,260, Cl. 164-255.000.
Torikai, Setsuo: *See*—
Yoshikawa, Akira; and Torikai, Setsuo, 5,009,038, Cl. 51-126.000.
Torri, Giangiacomo: *See*—
Fregnan, Giancarlo; Vandoni, Guido; and Torri, Giangiacomo, 5,010,064, Cl. 514-58.000.
Toshiba Silicone Co., Ltd.: *See*—
Umeda, Itsuki; Takashima, Masaaki; Zama, Yoshiaki; Takemura, Yasuhiko; Funabashi, Yuichi; Watanabe, Junichiro; Takeda, Kiyoshi; and Matsumoto, Makoto, 5,010,137, Cl. 525-104.000.
Tosoh SMD, Inc.: *See*—
Qamar, Sohail S.; Conard, Harry W.; and Hamilton, Lowell E., 5,009,765, Cl. 204-298.120.
Toyoshima, Yoshiki: *See*—
Ohmae, Tadayuki; Toyoshima, Yoshiki; Mashita, Kentaro; Yamaguchi, Noboru; and Nambu, Jinsho, 5,010,136, Cl. 525-66.000.
Toyota Jidosha Kabushiki Kaisha: *See*—
Harada, Kyouji; Kato, Eiji; Sakaguchi, Yoshikazu; Watanabe, Suzuaki; and Hoshino, Akira, 5,009,290, Cl. 188-71.500.
Sato, Kazuhiro; Kishi, Tomomi; Umeda, Koji; Uchida, Yasushi; and Takeuchi, Masahiko, 5,010,226, Cl. 219-81.000.
Sugimoto, Atsushi; Nakano, Osamu; Yasuda, Shigeru; Maeda, Chikatoshi; Ozone, Toshio; and Kawagoe, Makoto, 5,009,843, Cl. 420-112.000.
Tozier, Michel C. System of restoring rough tool handles. 5,009,730, Cl. 156-85.000.
Tracy, William J., III: *See*—
Bartilucci, Mark P.; Karsner, Grant G.; and Tracy, William J., III, 5,009,767, Cl. 208-85.000.
Trani, Michael: *See*—
Ergan, Francoise; Trani, Michael; and Andre, Gerald, 5,010,006, Cl. 435-177.000.
Traubel, Harro; Strenger, Heinrich; Weber, Karl A.; Muller, Hans-Werner; Zapfel, Horst; and Hummel, Axel, to Bayer Aktiengesellschaft. Process for finishing leather. 5,009,921, Cl. 427-31.000.
Traylor, Barry S.: *See*—
Keller, John A.; Traylor, Barry S.; and Tickner, Robert H., 5,010,482, Cl. 364-200.000.
Treffinger, Heinz, executor: *See*—
Fischer, Karl; Borst, Gerhard, executor; Treffinger, Heinz, executor; and Fischer, Dorothee, executrix, 5,010,235, Cl. 219-455.000.
Treloar, Ronald C.: *See*—
Halstead, Gary A.; and Treloar, Ronald C., 5,009,262, Cl. 165-140.000.
Treptow, Heinz: *See*—
Gehrmann, Bernd; and Treptow, Heinz, 5,008,992, Cl. 28-271.000.
Trezza, Ronald F. Clip construction for aligning siding sections. 5,009,051, Cl. 52-410.000.
Tridan Tool & Machine, Inc.: *See*—
Voss, Harlan F., 5,009,095, Cl. 72-335.000.
Trilling Medical Technologies, Inc.: *See*—
DiPippo, Ascanio G., 5,009,890, Cl. 424-195.100.
Trimborn, Peter, to Siemens Aktiengesellschaft. Liquid separator integrated into a pressure chamber housing abutting a liquid ring pump. 5,009,782, Cl. 210-360.100.
Trout, Torence J.: *See*—
El-Sayed, Lyla M.; and Trout, Torence J., 5,009,980, Cl. 430-114.000.

Truesdale, Carlton M.: *See—*
Miller, William J.; and Truesdale, Carlton M., 5,009,692, Cl. 65-3.110.

Trytko, David E., to Ampex Corporation. Video effects system with recirculation video combine and output combine. 5,010,407, Cl. 358-183.000.

Tsai, Su J. Scraper having a hand grip construction. 5,008,970, Cl. 15-236.010.

Tsay, Chyi J. Elevator type parking lot. 5,009,559, Cl. 414-259.000.

Tsubakimoto Chain Co.: *See—*
Kanehira, Makoto; Nakagawa, Takerou; Tsubakimoto, Yasumasa; Tanaka, Kouji; Takahashi, Toshio; and Ikeda, Masaaki, 5,009,630, Cl. 474-211.000.

Tsubakimoto, Yasumasa: *See—*
Kanehira, Makoto; Nakagawa, Takerou; Tsubakimoto, Yasumasa; Tanaka, Kouji; Takahashi, Toshio; and Ikeda, Masaaki, 5,009,630, Cl. 474-211.000.

Tsuboyama, Akira: *See—*
Eguchi, Ken; Kawada, Haruki; Sakai, Kunihiro; Tomida, Yoshinori; Matsuda, Hiroshi; Tsuboyama, Akira; Takimoto, Kiyoshi; and Takamatsu, Osamu, 5,009,489, Cl. 350-341.000.

Tsuchiya, Sohji: *See—*
Yamashita, Akio; Yoshimura, Susumu; and Tsuchiya, Sohji, 5,009,958, Cl. 428-411.100.

Tsuda, Youichirou: *See—*
Yoshio, Junichi; Hosaka, Sumio; Matsuoka, Hisao; Tsuda, Youichirou; Katagiri, Shoichi; and Nomura, Satoru, 5,010,417, Cl. 358-335.000.

Tsuji, Kentaro: *See—*
Terashima, Shigeo; Tsuji, Kentaro; and Fuji, Hiroshi, 5,010,539, Cl. 369-50.000.

Tsuji, Kentaroh: *See—*
Fuji, Hiroshi; Fujiwara, Tsuneo; Iwaki, Takashi; Numata, Tomiyuki; Tsuji, Kentaroh; Maeda, Shigemi; Yamaguchi, Takeshi; Kojima, Kunio; Deguchi, Toshihisa; and Terashima, Shigeo, 5,010,540, Cl. 369-50.000.

Tsuji, Kiyoshi; and Kimura, Kenji, to Olympus Optical Co., Ltd. Solid state imaging apparatus. 5,010,395, Cl. 358-44.000.

Tsuji, Tsuyoshi; Satoh, Masaaki; and Yunoki, Masayuki, to Med-Tech Inc. Method of controlling amount of removed water by ultrafiltration and control device for controlling amount of removed water by ultrafiltration in hemodialysis. 5,009,775, Cl. 210-85.000.

Tsujigaito, Isao: *See—*
Matsushita, Nobutaka; Okazaki, Hiroshi; Yamanouchi, Shosuke; Osawa, Yoshitaka; and Tsujigaito, Isao, 5,009,959, Cl. 428-419.000.

Tsujimoto, Yoshiharu: *See—*
Hayakawa, Takeshi; Narikawa, Shiro; Ohashi, Kunio; and Tsujimoto, Yoshiharu, 5,009,977, Cl. 430-84.000.

Tsukamoto, Tatsusabu. Clip. 5,008,982, Cl. 24-67.900.

Tsunashima, Kenji: *See—*
Sasaki, Yoshiyuki; Tsunashima, Kenji; Ookuma, Ikuo; and Fujii, Toshifumi, 5,010,404, Cl. 358-139.000.

Tsuruta, Shigeru; and Masuda, Sadao, to Sanyo Electric Co., Ltd. Electronic parts positioning apparatus. 5,010,474, Cl. 364-167.010.

Tsushima, Masayuki, to Tandy Electronics Japan Ltd. Recorder control apparatus for automatic telephone answering system. 5,010,567, Cl. 379-77.000.

Tsuyuguchi, Hiroshi; Noda, Yasushi; Morita, Tsutomu; and Shimozawa, Kenji, to TEAC Corporation. Optical head apparatus applicable to optical disc apparatus. 5,010,246, Cl. 250-216.000.

Turfco Manufacturing, Incorporated: *See—*
Vangsgard, Kip S., 5,009,270, Cl. 172-42.000.

Turi, Eran, to Union Camp Corporation. Extrusion coated substrates with separable and removable layers. 5,009,831, Cl. 264-510.000.

Turlik, Iwona: *See—*
Reisman, Arnold; Nayak, Deepak; and Turlik, Iwona, 5,009,360, Cl. 228-198.000.

Turner, Alan D.: *See—*
Chan, May L.; and Turner, Alan D., 5,009,728, Cl. 149-19.100.

Turner, Robert B.: *See—*
Herrington, Ronald M.; Turner, Robert B.; and Matijega, Roney J., 5,010,117, Cl. 521-159.000.

Tuthill, Clinton D.: *See—*
Curlee, Richard M.; Tuthill, Clinton D.; and Watkins, Randall D., 5,009,690, Cl. 65-40.000.

Uchida, Hiroyuki, to Fanuc LTD. Anti-clogging offset for rotor of synchronous motor. 5,010,266, Cl. 310-156.000.

Uchida, Yasushi: *See—*
Sato, Kazuhiro; Kishi, Tomomi; Umeda, Koji; Uchida, Yasushi; and Takeuchi, Masahiko, 5,010,226, Cl. 219-81.000.

Uchimoto, Yoshihiro: *See—*
Yasuda, Masashi; Uchimoto, Yoshihiro; and Mikata, Yasunori, 5,009,352, Cl. 226-94.000.

Uda, Tsuyoshi: *See—*
Migita, Masahito; Uda, Tsuyoshi; Kanehisa, Osam; and Shiiki, Masatoshi, 5,010,517, Cl. 365-114.000.

Udagawa, Tsunekazu, to Ishikawa Gasket Co., Ltd. Steel laminate gasket with associated beads. 5,009,438, Cl. 277-235.00B.

Udarov, Boris G.: *See—*
Fedin, Marat A.; Kuznetsova, Tatyana A.; Lysenkov, Viktor I.; Novikova, Svetlana A.; Savchuk, Valentin A.; Sedelnikov, Anatoly I.; Shabunya, Vera P.; Udarov, Boris G.; Tikhonova, Tatyana S.; Polyakova, Nina P.; and Paklin, Sergei I., 5,010,106, Cl. 514-546.000.

Ueda, Makoto; Ando, Yoshihira; Sakurai, Shungo; and Yoshioka, Ritsuo, to Kabushiki Kaisha Toshiba. Fuel assembly for nuclear reactor. 5,009,840, Cl. 376-435.000.

Ueda, Shigeru, to Canon Kabushiki Kaisha. Data processing apparatus. 5,010,513, Cl. 364-900.000.

Uehara, Katsuhiro; Kurita, Masanori; and Murakami, Masakazu, to Kabushiki Kaisha Kobe Seiko Sho. Interlock system for isostatic forming press. 5,009,584, Cl. 425-135.000.

Uehara, Masafumi: *See—*
Matsubara, Shinichi; Uehara, Masafumi; Bunya, Shinichi; and Katahashi, Eriko, 5,009,981, Cl. 430-175.000.

Uemura, Saburo, to Macome Corporation. Variable inductance displacement measuring device with slidable metal sleeve and ferrite bead core. 5,010,298, Cl. 324-207.190.

Uemura, Tsunesaburo, to Nikon Corporation. Laser processor. 5,010,230, Cl. 219-121.620.

Uemura, Tsuyoshi: *See—*
Wakita, Naohide; Uemura, Tsuyoshi; Ohnishi, Hiroyuki; Ohba, Noriko; Ota, Isao; and Fujita, Shingo, 5,010,327, Cl. 340-784.000.

Ueno, Hiroshi: *See—*
Okada, Kenji; and Ueno, Hiroshi, 5,009,758, Cl. 204-180.800.

Ueshima, Takaaki: *See—*
Yoneda, Kenzi; Ueshima, Takaaki; Kuzunuki, Soshiro; Morita, Yuzo; and Tobita, Toshimitsu, 5,010,472, Cl. 364-148.000.

Uesugi, Toshiharu: *See—*
Ibe, Hiroyuki; and Uesugi, Toshiharu, 5,009,864, Cl. 422-249.000.

Ueyama, Satoshi; Kawakubo, Hiroaki; Isoda, Satoru; and Maeda, Mitsuo, to Mitsubishi Denki K.K. Electronic device. 5,010,451, Cl. 361-504.000.

Uike, Hiroshi: *See—*
Kushida, Kazumitsu; Kudou, Osamu; Ogawa, Sumitaka; and Uike, Hiroshi, 5,009,211, Cl. 123-491.000.

Ulmann, Martin: *See—*
Mueller, Hans R.; Ulmann, Martin; Conti, Josef; and Muerdel, Guenter, 5,010,194, Cl. 544-258.000.

Ultra Creative Corp.: *See—*
Bennett, Ronald, 5,009,515, Cl. 383-23.000.

Umeda, Itsuki; Takashima, Masaaki; Zama, Yoshiaki; Takemura, Yasuhiko; Funabashi, Yuichi; Watanabe, Junichiro; Takeda, Kiyoshi; and Matsumoto, Makoto, to Japan Synthetic Rubber Co., Ltd.; and Toshiba Silicone Co., Ltd. Rubber composition, and oil seal and rubber hose obtained therefrom. 5,010,137, Cl. 525-104.000.

Umeda, Koji: *See—*
Sato, Kazuhiro; Kishi, Tomomi; Umeda, Koji; Uchida, Yasushi; and Takeuchi, Masahiko, 5,010,226, Cl. 219-81.000.

Unemura, Toyoaki: *See—*
Kawakami, Toshikatsu; Fukuda, Shin; Shinbo, Hiroyasu; Unemura, Toyoaki; Sakamoto, Ken; and Kondo, Tomoji, 5,010,406, Cl. 358-147.000.

Uni-Cardan Aktiengesellschaft: *See—*
Rettig, Helmut; Weiss, Karl; and Buss, Erich, 5,008,994, Cl. 29-235.000.

Unico Co., Ltd.: *See—*
Yasuda, Masashi; Uchimoto, Yoshihiro; and Mikata, Yasunori, 5,009,352, Cl. 226-94.000.

Union Camp Corporation: *See—*
Turi, Eran, 5,009,831, Cl. 264-510.000.

Union Carbide Chemicals and Plastics Technology Corporation: *See—*
Nielsen, Kenneth A., 5,009,367, Cl. 239-3.000.

Union Carbide Industrial Gases Technology Corporation: *See—*
Bikson, Benjamin; Nelson, Joyce K.; and Perrin, Jerry E., 5,009,678, Cl. 55-16.000.
Weise, Mark K.; Kingsley, Jeffery P.; and Litz, Lawrence M., 5,009,816, Cl. 261-21.000.

Uniroc Aktiebolag: *See—*
Lof, Stig U., 5,009,274, Cl. 175-260.000.

Uniroyal Chemical Company, Inc.: *See—*
Dekeyser, Mark A.; and Moore, Richard C., 5,010,068, Cl. 514-79.000.

Uniroyal Chemical Ltd. Ltee.: *See—*
Dekeyser, Mark A.; and Moore, Richard C., 5,010,068, Cl. 514-79.000.

Unisys Corp.: *See—*
Keller, John A.; Traylor, Barry S.; and Tickner, Robert H., 5,010,482, Cl. 364-200.000.

United Kingdom Atomic Energy Authority: *See—*
Kronfli, Esam; Lovell, Keith V.; Hooper, Alan; and Neat, Robin J., 5,009,970, Cl. 429-192.000.

United States of America
America: *See—*
Levi, Mark W., 5,009,240, Cl. 134-7.000.
Army: *See—*
Faughn, Jim A., 5,009,252, Cl. 137-614.040.
Hester, Troy I., 5,009,373, Cl. 242-158.00R.
Energy: *See—*
Curlee, Richard M.; Tuthill, Clinton D.; and Watkins, Randall D., 5,009,690, Cl. 65-40.000.
Maya, Leon, 5,010,045, Cl. 501-96.000.
Tomczuk, Zygmunt; Miller, William E.; Wolson, Raymond D.; and Gay, Eddie C., 5,009,752, Cl. 204-64.00R.
Health and Human Services: *See—*
Fuller, George C.; Martin, George R.; Mueller, Richard A.; and Reich, Reuven, 5,010,080, Cl. 514-255.000.
Gould, John H., 5,010,020, Cl. 436-77.000.
Interior: *See—*
Oremland, Ronald S., 5,009,786, Cl. 210-602.000.

National Aeronautics and Space Administration: *See*—
Hergenrother, Paul M.; and Connell, John W., 5,010,197, Cl. 544-353.000.
Navy: *See*—
Chan, May L.; and Turner, Alan D., 5,009,728, Cl. 149-19.100.
Huntley, William P.; and Swanick, David J., 5,010,341, Cl. 342-20.000.
Moody, Paul E., 5,009,182, Cl. 114-238.000.
Riley, Thomas P., 5,010,530, Cl. 367-154.000.
Shoemaker, Patrick A., 5,010,385, Cl. 357-41.000.
Silvia, Denis A., 5,009,162, Cl. 102-275.900.

U.S. Philips Corporation: *See*—
Dijken, Reinder H., 5,010,268, Cl. 310-254.000.
Haisma, Jan; Alting, Cornelis L.; and Michielsen, Theodorus M., 5,009,689, Cl. 65-33.000.
Hennings, Detlev F. K.; and Schreinemacher, Herbert J., 5,009,876, Cl. 423-598.000.
Kirchhof, Rolf, 5,009,526, Cl. 400-56.000.
van der Wilk, Ronald, 5,010,275, Cl. 315-106.000.

United Technologies Corporation: *See*—
Cox, Roger G.; Reber, Mark A.; and Yeager, Michael W., 5,010,509, Cl. 364-748.000.
Dicke, Curtis J., 5,010,256, Cl. 307-263.000.
Kromrey, Robert V., 5,009,687, Cl. 65-18.100.
Kromrey, Robert V., 5,009,823, Cl. 264-29.700.

United Technologies Electro Systems, Inc.: *See*—
Stewart, Kenneth W., Sr., 5,008,971, Cl. 15-250.200.

University of California, The Regents of the: *See*—
Bunshah, Rointan F.; Parsons, James D.; and Stafsudd, Oscar M., 5,010,035, Cl. 437-100.000.
Engelstad, Barry L.; Raymond, Kenneth N.; Huberty, John P.; and White, David L., 5,010,191, Cl. 544-225.000.
Rutter, William J.; and Santi, Daniel V., 5,010,175, Cl. 530-334.000.

University of Florida: *See*—
Sacks, Michael D.; and Lee, Hae-Weon, 5,009,822, Cl. 264-23.000.

University of Massachusetts Medical Center: *See*—
Fay, Fredric S.; Fogarty, Kevin E.; and Rodgers, Cyril, 5,009,488, Cl. 350-315.000.

University of Michigan, The Regents of the: *See*—
Villa-Garcia, Maria A.; and Schwank, Johannes, 5,010,049, Cl. 502-60.000.

University of Minnesota, Regents of the: *See*—
Baumann, Wolfgang J., 5,009,956, Cl. 428-402.200.

University of Rochester, The: *See*—
Elsayed-Ali, Hani E., 5,010,250, Cl. 250-310.000.

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Kerr, E. Michael; Connelly, Lawrence J.; Roe, William J.; and Vallowe, Robert M., 5,009,873, Cl. 423-320.000.

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Lachenmeier, Andreas, 5,008,991, Cl. 28-271.000.
VISX, Incorporated: *See*—
Clapham, Terrance N., 5,009,660, Cl. 606-166.000.
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Buchegger, Rudolf, 5,009,092, Cl. 72-148.000.
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Waeber, Rene; Knabenhans, Fritz; and Bachmann, Othmar, to Maschinenfabrik Rieter AG. Apparatus for treating cotton contaminated with honeydew. 5,008,978, Cl. 19-66.0CC.
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Wagner, Steven D., to Texo Corporation. Barrier coating. 5,010,131, Cl. 524-457.000.
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Branam, Timothy R.; Roberts, Jeffrey J.; and Schoenberger, Jack O., 5,009,101, Cl. 73-168.000.
Edwards, Charles W., 5,010,291, Cl. 323-222.000.
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Hill, Peter D., 5,010,576, Cl. 381-71.000.
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Matsumoto, Kenji; Yanagita, Tomoatsu; Nishiyama, Yoshinori; Nagai, Masahiko; and Morikuni, Mitsuru, 5,010,493, Cl. 364-490.000.
Yanai, Takeo, to Nippon Flute Co., Ltd. Bag making machine. 5,009,740, Cl. 156-353.000.
Yarborough, David K. Method of protecting the mucous membranes of the mouth while treating teeth. 5,009,885, Cl. 424-53.000.
Yardley, John P.: *See*—
Abou-Gharbia, Magid A.; Yardley, John P.; and Childers, Wayne E., Jr., 5,010,078, Cl. 514-252.000.
Yasuda, Masashi; Uchimoto, Yoshihiro; and Mikata, Yasunori, to Bando Chemical Industries, Ltd.; and Unico Co., Ltd. Apparatus for conveying dielectric sheets. 5,009,352, Cl. 226-94.000.
Yasuda, Shigeru: *See*—
Sugimoto, Atsushi; Nakano, Osamu; Yasuda, Shigeru; Maeda, Chikatoshi; Ozone, Toshio; and Kawagoe, Makoto, 5,009,843, Cl. 420-112.000.
Yasui, Mitsuo, to Kabushikikaisha Kaichu Kyoju Kenkyu-sho. Water tank apparatus. 5,009,188, Cl. 119-3.000.
Yasumura, Hiroto; Hirasawa, Masahide; Noji, Minoru; Kozuki, Susumu; Takahashi, Koji; and Yoshimura, Katsuji, to Canon Kabushiki Kaisha. Color video signal reproducing apparatus. 5,010,416, Cl. 358-314.000.
Yatsu, Tadao: *See*—
Kohsaka, Masaki; Higashi, Isaburou; Akana, Yoshinori; Hashimoto, Mikio; and Yatsu, Tadao, 5,010,146, Cl. 525-439.000.
Yatsuka, Takeshi; Murata, Hiroshi; Mizumura, Yutaka; and Kotera, Nobukazu, to Ashland Oil, Inc. Magnetic recording medium prepared with polyurethane resin modified by a bicyclic amide acetal. 5,009,960, Cl. 428-423.100.

Yeager, Michael W.: *See*—
Cox, Roger G.; Reber, Mark A.; and Yeager, Michael W., 5,010,509, Cl. 364-748.000.
Yeates, Steven G.; and Padget, John C., to Imperial Chemical Industries PLC. Production of aqueous-based fluoropolymer compositions. 5,010,121, Cl. 523-336.000.
Yee, Keen Y. Digital data capture for use with TV set or monitor. 5,010,499, Cl. 364-521.000.
Yelland, Michael; and Conway, John, to Imperial Chemical Industries PLC. Pyridazinone manufacture. 5,010,192, Cl. 544-239.000.
Yellow Freight System, Inc.: *See*—
Ruder, Carl J.; Haney, Ronald J.; Chutorash, Richard J.; Bostad, Wayne W.; Zweig, Arnold A.; and Payne, Lyle B., 5,009,560, Cl. 414-392.000.
Yelverton, Elizabeth M.: *See*—
Levinson, Arthur; Simonsen, Christian; and Yelverton, Elizabeth M., 5,010,002, Cl. 435-69.200.
Yen, Lung-Wu. Foldable razor assembly. 5,009,004, Cl. 30-47.000.
Yi, Chong S. Rotary internal combustion engine. 5,009,206, Cl. 123-248.000.
Yoder, Dennis G., to CTB, Inc. Plank structure for boat dock and the like. 5,009,045, Cl. 52-177.000.
Yokogawa Electric Corporation: *See*—
Harada, Kinji; Ikeda, Kyoichi; Kuwayama, Hideki; Kobayashi, Takashi; Nishikawa, Tadashi; Watanabe, Tetsuya; and Yoshida, Takashi, 5,009,108, Cl. 73-704.000.
Yokohama Rubber Co., Ltd., The: *See*—
Okumoto, Takaharu; Hayashida, Tadashi; Kawada, Kazuo; and Hayashi, Tetsuo, 5,009,423, Cl. 273-80.200.
Okumoto, Takaharu; Ninomiya, Toshio; and Hayashi, Tstsuya, 5,009,425, Cl. 273-167.00R.
Takano, Haruhiro, 5,010,142, Cl. 525-332.400.
Yokomachi, Naoya: *See*—
Ikeda, Hayato; Sawada, Masahiro; Nakamura, Norihiko; and Yokomachi, Naoya, 5,009,286, Cl. 184-6.170.
Yokono, Wataru: *See*—
Inoue, Hiroshi; Yokono, Wataru; and Okuda, Yasuji, 5,009,536, Cl. 401-198.000.
Yokota, Mitsuo: *See*—
Tanaka, Kazuyuki; Iwami, Etsuji; Matsuzawa, Jun; Mukoyama, Yoshiyuki; Shibata, Noriohiko; Hanawa, Akinori; and Yokota, Mitsuo, 5,009,949, Cl. 428-260.000.
Yokoyama, Kenji, to Yamaha Corporation. Acoustic apparatus. 5,009,280, Cl. 181-160.000.
Yokoyama, Kenji, to Yamaha Corporation. Acoustic apparatus. 5,009,281, Cl. 181-160.000.
Yoneda, Kenzi; Ueshima, Takaaki; Kuzunuki, Soshiro; Morita, Yuzo; and Tobita, Toshimitsu, to Hitachi, Ltd. Customer participatory elevator control system. 5,010,472, Cl. 364-148.000.
Yonehara, Takao: *See*—
Tokunaga, Hiroyuki; Yamagata, Kenji; and Yonehara, Takao, 5,010,033, Cl. 437-83.000.
Yoshida, Keiji; Funato, Ryo; Takahiro, Syuji; Kubo, Shinji; and Inagaki, Notoshi, to Mitsubishi Rayon Co., Ltd. Preparation process for toner polymer. 5,009,978, Cl. 430-109.000.
Yoshida, Kimiyoshi; Sakano, Akio; Tamori, Hirofumi; and Chatani, Masayuki, to Sony Corporation. Hand-written, on-line character recognition apparatus and method. 5,010,579, Cl. 382-13.000.
Yoshida, Satoshi; Nakahara, Toshiaki; Tanikawa, Hirohide; and Sakashita, Kiichiro, to Canon Kabushiki Kaisha. Image forming method and image forming apparatus. 5,009,973, Cl. 430-45.000.
Yoshida, Shigemitsu: *See*—
Fujita, Toshio; Yamashita, Yoshisato; Yoshida, Shigemitsu; and Yamahira, Katsutoshi, 5,009,696, Cl. 71-64.070.
Yoshida, Suguru: *See*—
Saitoh, Masahiro; Yoshida, Suguru; Obata, Keiichi; and Ono, Yoshinobu, 5,009,463, Cl. 296-210.000.
Yoshida, Susumu, to Mitsubishi Denki Kabushiki Kaisha. Tandem solar cell. 5,009,719, Cl. 136-249.000.
Yoshida, Takashi: *See*—
Harada, Kinji; Ikeda, Kyoichi; Kuwayama, Hideki; Kobayashi, Takashi; Nishikawa, Tadashi; Watanabe, Tetsuya; and Yoshida, Takashi, 5,009,108, Cl. 73-704.000.
Yoshikai, Takeshi: *See*—
Higashio, Kimihiko; and Yoshikai, Takeshi, 5,010,363, Cl. 355-206.000.
Yoshikawa, Akira; and Torikai, Setsuo, to NKG Insulators, Ltd. Automatic chamfering machine. 5,009,038, Cl. 51-126.000.
Yoshikawa, Toshiharu; and Sugiura, Shozou, to Menicon Co., Ltd. Ultraviolet-hardenable adhesive and bonding method employing same. 5,009,731, Cl. 156-154.000.
Yoshimoto, Masahiko; and Matsumura, Tetsuya, to Mitsubishi Denki Kabushiki Kaisha. Dynamic semiconductor memory device formed by 2-transistor cells. 5,010,519, Cl. 365-149.000.
Yoshimura, Hironori; and Shyogo, Inada, to Mitsubishi Metal Corporation. Microdrill bit. 5,009,705, Cl. 75-240.000.
Yoshimura, Katsuji: *See*—
Yasumura, Hiroto; Hirasawa, Masahide; Noji, Minoru; Kozuki, Susumu; Takahashi, Koji; and Yoshimura, Katsuji, 5,010,416, Cl. 358-314.000.
Yoshimura, Susumu: *See*—
Yamashita, Akio; Yoshimura, Susumu; and Tsuchiya, Sohji, 5,009,958, Cl. 428-411.100.
Yoshino, Akira: *See*—
Mukai, Tadayoshi; and Yoshino, Akira, 5,010,287, Cl. 318-801.000.
Yoshio, Junichi; Hosaka, Sumio; Matsuoka, Hisao; Tsuda, Youichirou; Katagiri, Shoichi; and Nomura, Satoru, to Pioneer Electronic Corporation. Playback method for use in a recording medium playing apparatus using information control signals. 5,010,417, Cl. 358-335.000.
Yoshioka, Ritsuo: *See*—
Ueda, Makoto; Ando, Yoshihira; Sakurai, Shungo; and Yoshioka, Ritsuo, 5,009,840, Cl. 376-435.000.
Yost, Richard A.; and Damerow, David H., to Harris Corporation. Data overlap decoder. 5,010,558, Cl. 375-37.000.
Yotvat, Jacob: *See*—
Lin, Israel J.; and Yotvat, Jacob, 5,009,791, Cl. 210-695.000.
Young, David R.: *See*—
Fisher, John M.; and Young, David R., 5,009,249, Cl. 137-495.000.
Young, Donald R.; and Young, Ruth L. Golf ball vending machine. 5,009,330, Cl. 221-196.000.
Young, Douglas G.: *See*—
Lipman, Kenneth; and Young, Douglas G., 5,010,470, Cl. 363-132.000.
Young, Patrick H.: *See*—
Coates, Don M.; and Young, Patrick H., 5,009,820, Cl. 264-13.000.
Young, Ruby Y. Cat restrainer. 5,009,196, Cl. 119-101.000.
Young, Ruth L.: *See*—
Young, Donald R.; and Young, Ruth L., 5,009,330, Cl. 221-196.000.
Yu, Simon H. P., to B. F. Goodrich Company, The. Copolymers of ethylene oxide as antistatic additives. 5,010,139, Cl. 525-187.000.
Yuan, Han-Tzong: *See*—
Reid, Lee R.; and Yuan, Han-Tzong, 5,009,476, Cl. 350-96.110.
Yuhasz, Donald E. Method of playing a geographical map game. 5,009,430, Cl. 273-255.000.
Yukawa, Akira, to NEC Corporation. Analog-to-digital converter having an excellent signal-to-noise ratio for small signals. 5,010,347, Cl. 341-143.000.
Yuki, Eiji: *See*—
Kuzuya, Susumu; Shimizu, Seiji; Kato, Mikio; Ishikawa, Yujiro; Sakai, Takashi; and Yuki, Eiji, 5,009,530, Cl. 400-188.000.
Yunoki, Masayuki: *See*—
Tsuji, Tsuyoshi; Satoh, Masaaki; and Yunoki, Masayuki, 5,009,775, Cl. 210-85.000.
Yurchak, Sergei: *See*—
Avidan, Amos A.; and Yurchak, Sergei, 5,009,851, Cl. 422-141.000.
Yushio, Yasuhisa: *See*—
Sasame, Akira; Sakanoue, Hitoyuki; Takeuchi, Hisao; Miyake, Masaya; Yamakawa, Akira; Yushio, Yasuhisa; and Akazawa, Hitoshi, 5,010,388, Cl. 357-70.000.
Yuunaga, Toshifumi, to Suzuki Jidosha Kogyo Kabushiki Kaisha. Air cleaner of engine for vehicle. 5,009,686, Cl. 55-419.000.
Zahnfabrik Friedrichshafen AG: *See*—
Meisinger, Erwin; and Zimmer, Jurgen, 5,009,126, Cl. 74-733.100.
Zahnradfabrik Friedrichshafen, AG.: *See*—
Lang, Armin; and Schweizer, Bernhard, 5,009,110, Cl. 73-862.330.
Zahradnicek, Ales: *See*—
Kunz, Reiner; Babl, Albert; Zahradnicek, Ales; and Dietrich, Rainer, 5,009,674, Cl. 51-295.000.
Zama, Yoshiaki: *See*—
Umeda, Itsuki; Takashima, Masaaki; Zama, Yoshiaki; Takemura, Yasuhiko; Funabashi, Yuichi; Watanabe, Junichiro; Takeda, Kiyoshi; and Matsumoto, Makoto, 5,010,137, Cl. 525-104.000.
Zapfel, Horst: *See*—
Traubel, Harro; Strenger, Heinrich; Weber, Karl A.; Muller, Hans-Werner; Zapfel, Horst; and Hummel, Axel, 5,009,921, Cl. 427-31.000.
Zare, Richard N.; Huang, Xiaohua; and Ohms, Jack I., to Leland Stanford Junior University, Board of Trustees of the. System for measuring electrokinetic properties and for characterizing electrokinetic separations by monitoring current in electrophoresis. 5,009,760, Cl. 204-183.300.
Zavatone, James F. Bridge separated tray and blank for forming it. 5,009,363, Cl. 229-120.170.
Zdybel, Frank, Jr.: *See*—
Makkuni, Ranjit; Zdybel, Frank, Jr.; and Stults, Robert A., 5,010,500, Cl. 364-521.000.
Zelko, William E.: *See*—
Fogg, Michael W.; Koegel, Keith S.; Shuey, John R.; Zelko, William E.; and Beamenderfer, Robert E., 5,009,614, Cl. 439-497.000.
Zemek, Michal: *See*—
Pajgrt, Jan; Smetak, Vincenc; Kalina, Jaroslav; Zemek, Michal; Pus, Milan; and Bucek, Pavel, 5,009,253, Cl. 139-116.200.
Zenith Data Systems Corporation: *See*—
Krenz, Horst M., 5,010,426, Cl. 360-97.010.
Zeugner, Horst: *See*—
Waldeck, Harald; Benson, Werner; Zeugner, Horst; Wolf, Klaus-Ullrich; Gregory, Peter-Colin; Hamminga, Derk; and van Wijngsarden, Ineke, 5,010,076, Cl. 514-221.000.
Zhukov, Jury K.: *See*—
Lipukhin, Jury V.; Danilov, Leonid I.; Ivoditov, Albert N.; Garber, Eduard A.; Subbotin, Anatoly N.; Pavlov, Valentin P.; Zhukov, Jury K.; and Pimenov, Alexandr F., 5,009,037, Cl. 51-7.000.
Ziggity Systems, Inc.: *See*—
Hostetler, Eldon, 5,009,194, Cl. 119-72.000.
Zimmer, Jurgen: *See*—
Meisinger, Erwin; and Zimmer, Jurgen, 5,009,126, Cl. 74-733.100.
Zimmerman, Peter: *See*—
Schmidt, Richard R.; Baer, Thomas; Zimmerman, Peter; and Wendel, Albrecht, 5,010,059, Cl. 514-25.000.
Zimmermann, Arnold. Closure clip, especially for the closure of bags and a method and machine for applying the same. 5,008,980, Cl. 24-30.50R.

Zinsmeyer, Thomas M., to Carrier Corporation. Refrigerant flow control device. 5,009,079, Cl. 62-218.000.

Zisa, Michele; and Palara, Sergio, to SGS-Thomson Microelectronics s.r.l. Control circuit for the clamping voltage of an inductive load driven by a power device in a high side driver configuration. 5,010,439, Cl. 361-91.000.

Ziuchkovski, Michael J., to Planar Systems, Inc. Driving network for TFEL panel employing a video frame buffer. 5,010,325, Cl. 340-781.000.

Zmuda, James E.: *See*—
Bathrick, Erwin W.; and Zmuda, James E., 5,010,572, Cl. 380-21.000.

Znaiden, Alexander P.: *See*—
Wilmott, James M.; Koelle, William H.; and Znaiden, Alexander P., 5,010,110, Cl. 514-758.000.

ZVS Vyzkumnevyvojovy ustav: *See*—
Pajgrt, Jan; Smetak, Vincenc; Kalina, Jaroslav; Zemek, Michal; Pus, Milan; and Bucek, Pavel, 5,009,253, Cl. 139-116.200.

Zweig, Arnold A.: *See*—
Ruder, Carl J.; Haney, Ronald J.; Chutorash, Richard J.; Bostad, Wayne W.; Zweig, Arnold A.; and Payne, Lyle B., 5,009,560, Cl. 414-392.000.

Zwicker, Horst. Method of forming pretzels from strands of dough. 5,009,910, Cl. 426-499.000.

3TL Trading Co.: *See*—
Laakso, Timo, 5,009,278, Cl. 180-9.440.

501 Greenwich Pharmaceuticals Incorporated: *See*—
Ronsen, Bruce; Arora, Sudershan K.; and Thomas, Albert V., 5,010,058, Cl. 514-23.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 23RD DAY OF APRIL, 1991

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Ballheimer, Benny; and Stratton, Michael K., to Caterpillar Inc. Internal combustion engine noise reduction plate. Re. 33,575, Cl. 123-198.00E.

Caterpillar Inc.: *See*—
Ballheimer, Benny; and Stratton, Michael K., Re. 33,575, Cl. 123-198.00E.

Eaton Corporation: *See*—
Latsko, James M., Re. 33,576, Cl. 192-88.00B.

Farrall, George A.: *See*—
Harnden, John D., Jr.; Kornrumpf, William P.; and Farrall, George A., Re. 33,577, Cl. 310-332.000.

General Electric Company: *See*—
Harnden, John D., Jr.; Kornrumpf, William P.; and Farrall, George A., Re. 33,577, Cl. 310-332.000.

Harnden, John D., Jr.; Kornrumpf, William P.; and Farrall, George A., to General Electric Company. Advanced piezoceramic power switching devices employing protective gastight enclosure and method of manufacture. Re. 33,577, Cl. 310-332.000.

Kirk, Alan R.; and Scherrer, Robert A., to Riker Laboratories, Inc. Substituted biphenyl derivatives. Re. 33,574, Cl. 514-563.000.

Kornrumpf, William P.: *See*—
Harnden, John D., Jr.; Kornrumpf, William P.; and Farrall, George A., Re. 33,577, Cl. 310-332.000.

Latsko, James M., to Eaton Corporation. Coupling assembly and friction shoe therefor. Re. 33,576, Cl. 192-88.00B.

Riker Laboratories, Inc.: *See*—
Kirk, Alan R.; and Scherrer, Robert A., Re. 33,574, Cl. 514-563.000.

Scherrer, Robert A.: *See*—
Kirk, Alan R.; and Scherrer, Robert A., Re. 33,574, Cl. 514-563.000.

Stratton, Michael K.: *See*—
Ballheimer, Benny; and Stratton, Michael K., Re. 33,575, Cl. 123-198.00E.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

deRojas, Edward: *See*—
Frieder, Philip M.; and deRojas, Edward, B1 4,645,317, Cl. 351-164.000.

Frieder, Philip M.; and deRojas, Edward, to Optical Systems International, Inc. Eyeglass lens modules and method. B1 4,645,317, 4-23-91, Cl. 351-164.000.

M & I Door Systems Limited: *See*—
Palmer, Glenn R., B1 4,478,268, Cl. 160-310.000.

Optical Systems International, Inc.: *See*—
Frieder, Philip M.; and deRojas, Edward, B1 4,645,317, Cl. 351-164.000.

Palmer, Glenn R., to M & I Door Systems Limited. Door structure. B1 4,478,268, 4-23-91, Cl. 160-310.000.

LIST OF DESIGN PATENTEES

A. L. Hansen Manufacturing Company: *See*—
Hansen, Randall C.; and Krahn, Gilbert H., 316,365, Cl. D8-331.000.
Hansen, Randall C.; and Krahn, Gilbert H., 316,366, Cl. D8-331.000.

Abbestam, Goran; and Lachonius, Leif. Beam. 316,444, 4-23-91, Cl. D25-122.000.

Advanced Products and Technologies, Inc.: *See*—
VanNoy, Allen W., 316,412, Cl. D14-158.000.

Aladdin Industries: *See*—
Bridges, John A.; and Booten, Richard D., 316,331, Cl. D3-74.000.

Aladdin Industries Inc.: *See*—
Bridges, John A.; and Booten, Richard D., 316,332, Cl. D3-74.000.

Aloka Co., Ltd.: *See*—
Kijima, Masaichi; and Yajima, Nobumichi, 316,448, Cl. D24-26.000.

Andersen, Edel S., to Interlego AG. Toy building element. 316,430, 4-23-91, Cl. D21-108.000.

Anderson, John W., to Temp-Tech Co. Inc. Food serving tray. 316,359, 4-23-91, Cl. D7-549.000.

Anson, Karen K. Combination baby cooling pad and cover therefor. 316,352, 4-23-91, Cl. D6-596.000.

Aoyama, Minoru; Komada, Takeshi; and Hirata, Tomohiko, to Canon Kabushiki Kaisha. Copying machine. 316,425, 4-23-91, Cl. D18-39.000.

Aoyama, Minoru: *See*—
Komada, Takeshi; Hirata, Tomohiko; and Aoyama, Minoru, 316,424, Cl. D18-39.000.

Arginsky, Richard C., to Plush Factory Inc., The. Combined stuffed toy and transparent container therefor. 316,439, 4-23-91, Cl. D21-159.000.

Austin, Donald P.; Lawrence, Albert L.; and Prewitt, Arthur C., to Gilbarco Inc. Credit and debit authorization panel or similar article. 316,471, 4-23-91, Cl. D99-43.000.

Australux North America, Ltd.: *See*—
Spotts, James C.; and Chai, Haw R., 316,458, Cl. D26-67.000.

Baber, Kevin R., to Smiths Industries Public Limited Company. Surgical drainage container. 316,450, 4-23-91, Cl. D24-58.000.

Baker, Larry. Cover for an automobile-type cigarette lighter receptacle. 316,402, 4-23-91, Cl. D13-156.000.

Batts, Inc.: *See*—
Duester, Everett L., 316,334, Cl. D6-328.000.

Baxter International Inc.: *See*—
D'Aquino, Michael; and Becker, Julius, 316,449, Cl. D24-29.000.

Beaudry, Steven A. Support pedestal for a table. 316,350, 4-23-91, Cl. D6-495.000.

Becker, Julius: *See*—
D'Aquino, Michael; and Becker, Julius, 316,449, Cl. D24-29.000.

Benson, Steven R. Turbine housing. 316,418, 4-23-91, Cl. D15-5.000.

Black & Decker Inc.: *See*—
Reiferscheid, Ulrich; and Spratt, Robin H., 316,465, Cl. D32-17.000.

Boggus, Wedon G., Jr., to Stor-A-File, Inc. Storage box blank. 316,372, 4-23-91, Cl. D9-433.000.

Bool, Robert. Loin rest. 316,354, 4-23-91, Cl. D6-601.000.

Booten, Richard D.: *See*—
Bridges, John A.; and Booten, Richard D., 316,331, Cl. D3-74.000.
Bridges, John A.; and Booten, Richard D., 316,332, Cl. D3-74.000.

Borgmann, Michael, to Robert Krups Stiftung & Co. KG. Cappuccino making adapter for an espresso machine. 316,356, 4-23-91, Cl. D7-398.000.

Bosler, Paula K.; Bosler, Robert H.; and Pomeranz, Melvin A., to Firm Action Sports Apparel. Sports brassiere. 316,322, 4-23-91, Cl. D2-24.000.

Bosler, Robert H.: *See—*
Bosler, Paula K.; Bosler, Robert H.; and Pomeranz, Melvin A., 316,322, Cl. D2-24.000.

Boston Metal Products Corp.: *See—*
Rubin, Richard J., 316,351, Cl. D6-513.000.

Bridges, John A.; and Booten, Richard D., to Aladdin Industries. Container. 316,331, 4-23-91, Cl. D3-74.000.

Bridges, John A.; and Booten, Richard D., to Aladdin Industries Inc. Container. 316,332, 4-23-91, Cl. D3-74.000.

Bridgestone/Firestone, Inc.: *See—*
Wallet, Bill J.; and Molnar, Joseph F., 316,388, Cl. D12-147.000.

Brown, David P.: *See—*
Sandrock, Dale D.; Gill, Stephen H.; Walter, Llewellyn L.; Brown, David P.; and Wilson, James, 316,468, Cl. D34-37.000.

Brown Jordan Company: *See—*
Frinier, Richard, 316,336, Cl. D6-361.000.
Frinier, Richard, 316,338, Cl. D6-380.000.

Caho-Yang Electric Mgf. Co., Ltd.: *See—*
Lee, Wen T., 316,446, Cl. D23-335.000.

Calleja, Ronald K. Magnet. 316,404, 4-23-91, Cl. D13-183.000.

Canon Kabushiki Kaisha: *See—*
Aoyama, Minoru; Komada, Takeshi; and Hirata, Tomohiko, 316,425, Cl. D18-39.000.
Komada, Takeshi; Hirata, Tomohiko; and Aoyama, Minoru, 316,424, Cl. D18-39.000.
Komada, Takeshi; and Isomoto, Masataka, 316,426, Cl. D18-44.000.
Matsumura, Yoshiyuki, 316,419, Cl. D16-202.000.
Shinano, Toru; and Sakuta, Kazuaki, 316,421, Cl. D16-237.000.
Tanaka, Chifuyu, 316,420, Cl. D16-202.000.

Cant, Malcolm C.; and Major, Ron, to Technophone Limited. Stand for a portable telephone. 316,416, 4-23-91, Cl. D14-252.000.

Carnathan, Alan B.; and Carnathan, Susan G., to Slack, Inc. Foldable chiropractic pillow. 316,451, 4-23-91, Cl. D24-64.000.

Carnathan, Susan G.: *See—*
Carnathan, Alan B.; and Carnathan, Susan G., 316,451, Cl. D24-64.000.

Carr, Jeff A. Combined vehicle step and mounting bracket. 316,394, 4-23-91, Cl. D12-203.000.

Casio Computer Co., Ltd.: *See—*
Yoshitake, Isamu, 316,405, Cl. D14-100.000.

Caterpillar Industrial Inc.: *See—*
Sandrock, Dale D.; Gill, Stephen H.; Walter, Llewellyn L.; Brown, David P.; and Wilson, James, 316,468, Cl. D34-37.000.

CertainTeed Corporation: *See—*
Westphal, Dennis; and Piles, Jonathan, 316,453, Cl. D25-122.000.

CGR Ultrasonic: *See—*
Dubut, Patrick G., 316,376, Cl. D10-60.000.

Chai, Haw R.: *See—*
Spotts, James C.; and Chai, Haw R., 316,458, Cl. D26-67.000.

Chanda, William D., to General Electric Company. Cooking range drawer panel. 316,357, 4-23-91, Cl. D7-405.000.

Choi, Lung W., to Goodway Electrical Co., Ltd. Iron. 316,467, 4-23-91, Cl. D32-70.000.

Clark Equipment Company: *See—*
Kaczmarski, Wally L., 316,393, Cl. D12-192.000.

Coon, Michael J. Children's toy organizer. 316,343, 4-23-91, Cl. D6-436.000.

Cooper Industries, Inc.: *See—*
Mercer, James M.; and Singer, Keith A., 316,403, Cl. D13-160.000.

Craft, Homer L. Fishing rod and reel holder. 316,327, 4-23-91, Cl. D3-38.000.

Critical Industries, Inc.: *See—*
Woodson, James C.; Mumford, Ron W.; and Kondo, Kenneth S., 316,447, Cl. D23-365.000.

Curtis Manufacturing Company, Inc.: *See—*
Tortola, Angelo; and Howitt, Robert, 316,454, Cl. D26-24.000.

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Taylor, Terrance N.: *See*—
Wall, Eugene J.; Hillier, Bruce D.; and Taylor, Terrance N., 316,417, Cl. D14-299.000.
Teagarden, Raymond E. Vehicle service trailer, or similar article. 316,384, 4-23-91, Cl. D12-94.000.
Technophone Limited: *See*—
Cant, Malcolm C.; and Major, Ron, 316,416, Cl. D14-252.000.
Temp-Tech Co. Inc.: *See*—
Anderson, John W., 316,359, Cl. D7-549.000.
Thomas Industries Inc.: *See*—
De'Armond, Robert, 316,457, Cl. D26-67.000.
Thompson, Joseph, to Sterling Drug Inc. Combined bottle and measuring cup cover. 316,369, 4-23-91, Cl. D9-337.000.
Thorp, Christopher S., to Dinex International, Inc. Insulated drinking tumbler. 316,358, 4-23-91, Cl. D7-531.000.
Thorp, Christopher S., to Dinex International, Inc. Insulated bowl. 316,360, 4-23-91, Cl. D7-565.000.
Tiedemann, Robert J., to ITT Corporation. Thermostat. 316,375, 4-23-91, Cl. D10-50.000.
Tinz, Bernhard. Writing implement. 316,427, 4-23-91, Cl. D19-48.000.
Tortola, Angelo; and Howitt, Robert, to Curtis Manufacturing Company, Inc. Battery operated light for a handheld computer game machine screen. 316,454, 4-23-91, Cl. D26-24.000.
Tsubaki, Hiroyuki; Yoshikawa, Masao; and Masunari, Kazutoshi, to Matsushita Electric Industrial Co., Ltd. Television receiver. 316,408, 4-23-91, Cl. D14-126.000.
Tumble Forms, Inc.: *See*—
Gravel, Michael R., 316,463, Cl. D29-10.000.
Ueda Japan Radio Co., Ltd.: *See*—
Kijima, Masaichi; and Yajima, Nobumichi, 316,448, Cl. D24-26.000.
U.S. Philips Corporation: *See*—
Krol, Leonardus A. C., 316,455, Cl. D26-44.000.
VanNoy, Allen W., to Advanced Products and Technologies, Inc. Voice translator. 316,412, 4-23-91, Cl. D14-158.000.
Veasey, Michael J. Laundry container. 316,466, 4-23-91, Cl. D32-37.000.
Vicento, Peter. Socket organizer with a handle. 316,329, 4-23-91, Cl. D3-74.000.
Vicento, Peter. Socket organizer. 316,330, 4-23-91, Cl. D3-74.000.
Vola, Jean-Jacques, to Honeywell, Inc. Container. 316,371, 4-23-91, Cl. D9-353.000.
Waine, Jerrie. Doll. 316,438, 4-23-91, Cl. D21-171.000.
Wall, Eugene J.; Hillier, Bruce D.; and Taylor, Terrance N., to Motorola, Inc. Radio housing or similar article. 316,417, 4-23-91, Cl. D14-299.000.
Wallet, Bill J.; and Molnar, Joseph F., to Bridgestone/Firestone, Inc. Tire. 316,388, 4-23-91, Cl. D12-147.000.
Walter, Llewellyn L.: *See*—
Sandrock, Dale D.; Gill, Stephen H.; Walter, Llewellyn L.; Brown, David P.; and Wilson, James, 316,468, Cl. D34-37.000.
Watanabe, Katsuhito; and Seki, Naoko, to Oki Electric Industry Co., Ltd. Portable radio telephone. 316,410, 4-23-91, Cl. D14-138.000.
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Stephen, James C.; Schlosser, Erich J.; and Pestka, Donald D., 316,355, Cl. D7-339.000.
Westphal, Dennis; and Piles, Jonathan, to CertainTeed Corporation. Window component extrusion. 316,453, 4-23-91, Cl. D25-122.000.
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Willoughby, Kathy. Woman's shoulder bag. 316,328, 4-23-91, Cl. D3-44.000.
Wilson, James: *See*—
Sandrock, Dale D.; Gill, Stephen H.; Walter, Llewellyn L.; Brown, David P.; and Wilson, James, 316,468, Cl. D34-37.000.
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Yajima, Nobumichi: *See*—
Kijima, Masaichi; and Yajima, Nobumichi, 316,448, Cl. D24-26.000.
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Yamaha Corporation: *See*—
Mine, Junko, 316,422, Cl. D17-22.000.
Yamaha Hatsudoki Kabushiki Kaisha: *See*—
Yamada, Toshiharu; and Kobayashi, Kunihiko, 316,395, Cl. D12-304.000.
Yazaki Corporation: *See*—
Sakai, Hitoshi, 316,401, Cl. D13-146.000.
Yonehara, Fuyuki, to Fuji Photo Film Co., Ltd. Audio cassette. 316,406, 4-23-91, Cl. D14-121.000.
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Yoshikawa, Masao: *See*—
Tsubaki, Hiroyuki; Yoshikawa, Masao; and Masunari, Kazutoshi, 316,408, Cl. D14-126.000.
Yoshikawa, Toshiaki; and Shiozaki, Akihisa, to Daiwa Seiko, Inc. Fishing reel. 316,443, 4-23-91, Cl. D22-141.000.
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Bradford, Lowell G.: *See*—
Bradford, Norman G.; and Bradford, Lowell G., 7,502, Cl. 37.000.
Bradford, Norman G.; and Bradford, Lowell G., 7,503, Cl. 38.000.
Bradford, Norman G.; and Bradford, Lowell G., 7,504, Cl. 38.000.
Bradford, Norman G.; and Bradford, Lowell G., 7,506, Cl. 41.000.
Bradford, Norman G.; and Bradford, Lowell G., 7,507, Cl. 41.000.
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Tos, John W., 7,505, Cl. 41.000.
Tos, John W., to Tos Farms, Inc. Nectarine tree, "Late Red Jim II". 7,505, 4-23-91, Cl. 41.000.

CLASSIFICATION OF PATENTS

ISSUED APRIL 23, 1991

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

2.5	5,008,959
104	5,008,960
195	5,008,961
234	5,008,962

CLASS 4

73	5,009,021
094	5,009,022
620	5,008,963
661	5,008,964

CLASS 5

61	5,008,965
496	5,008,966

CLASS 8

115.56	5,009,667
557	5,009,668
573	5,009,669

CLASS 14

7	5,008,967

CLASS 15

1.51	5,008,968
227	5,008,969
236.01	5,008,970
250.2	5,008,971
312.2	5,008,972
416	5,008,973

CLASS 16

114 R	5,008,974
266	5,008,975
276	5,008,976
278	5,008,977

CLASS 19

66 CC	5,008,978
97	5,008,979

CLASS 24

30.5 R	5,008,980
49 R	5,008,981
67.9	5,008,982
131 C	5,008,983
289	5,008,986
303	5,008,984
370	5,008,985
442	5,008,987
510	5,008,988
641	5,008,989

CLASS 27

2	5,008,990

CLASS 28

271	5,008,991
	5,008,992

CLASS 29

125	5,008,993
235	5,008,994
252	5,008,995
727	5,008,996
827	5,008,997
840	5,008,998
882	5,008,999
888.02	5,009,000
888.08	5,009,001
890.031	5,009,002

CLASS 30

30	5,009,003
47	5,009,004
90.6	5,009,005
	5,009,006
92	5,009,007
158	5,009,008
172	5,009,009
308.1	5,009,010
389	5,009,011
394	5,009,012

CLASS 33

25.1	5,009,013
287	5,009,014
409	5,009,015

CLASS 34

41	5,009,016

CLASS 37

142 A	5,009,017

CLASS 40

306	5,009,018
541	5,009,019
547	5,009,020

CLASS 42

73	5,009,021
094	5,009,022

CLASS 43

21.2	5,009,027
42.3	5,009,024
42.5	5,009,023
44.8	5,009,026
44.83	5,009,025

CLASS 44

385	5,009,670
593	5,009,672
598	5,009,671

CLASS 47

40.5	5,009,028
62	5,009,029
64	5,009,030
	5,009,031
79	5,009,032
80	5,009,033

CLASS 49

192	5,009,034
352	5,009,035
485	5,009,036

CLASS 51

7	5,009,037
126	5,009,038
165.77	5,009,039
214	5,009,040
293	5,009,673
295	5,009,674
	5,009,675
309	5,009,676

CLASS 52

2.19	5,009,041
36	5,009,042
145	5,009,043
171	5,009,044
177	5,009,045
197	5,009,046
218	5,009,047
308	5,009,048
408	5,009,050
410	5,009,051
742	5,009,052

CLASS 53

58	5,009,053
397	5,009,054
	5,009,055
412	5,009,056
439	5,009,057
469	5,009,058
472	5,009,059
512	5,009,060

CLASS 55

12	5,009,677
16	5,009,678
	5,009,679
40	5,009,680
131.	5,009,683
159	5,009,682
340	5,009,684
385.2	5,009,685
416	5,009,681
419	5,009,686

CLASS 56

104	5,009,061
341	5,009,062

CLASS 57

124	5,009,063

CLASS 60

276	5,009,064
288	5,009,065
415	5,009,066
484	5,009,067
583	5,009,068
641.1	5,009,069
753	5,009,070

CLASS 62

4	5,009,071
6	5,009,072
51.1	5,009,073
115	5,009,074
127	5,009,075
129	5,009,076
160	5,009,077
	5,009,078
218	5,009,079
256	5,009,080
264	5,009,081
390	5,009,082
400	5,009,083
441	5,009,084
476	5,009,085
	5,009,086

CLASS 65

3.11	5,009,692
18.1	5,009,687
18.3	5,009,688
33	5,009,689
40	5,009,690
106	5,009,691
107	5,009,693
115	5,009,694
182.2	5,009,695

CLASS 70

49	5,009,087
63	5,009,088
114	5,009,089
326	5,009,090

CLASS 71

24	5,009,697
64.07	5,009,696
92	5,009,698
	5,009,699
94	5,009,700
96	5,009,701
100	5,009,702

CLASS 72

21	5,009,091
148	5,009,092
177	5,009,093
225	5,009,094
239	5,009,096
335	5,009,095
387	5,009,097
389	5,009,098

CLASS 73

1 G	5,009,099
155	5,009,100
168	5,009,101
590	5,009,102
597	5,009,103
	5,009,104
621	5,009,105
651	5,009,106
704	5,009,108
705	5,009,107
861.38	5,009,109
862.33	5,009,110
862.61	5,009,111
866	5,009,112
866.5	5,009,113

CLASS 74

15.63	5,009,114
89.150	5,009,115
331	5,009,116
	5,009,117
	5,009,118
489	5,009,119
493	5,009,120
	5,009,121
502.6	5,009,122
567	5,009,123
595	5,009,124
606 R	5,009,125
733.1	5,009,126
866	5,009,127
	5,009,128
	5,009,129

CLASS 75

10.36	5,009,703
238	5,009,704
240	5,009,705
244	5,009,706
375	5,009,707

CLASS 81

9.4	5,009,130
45	5,009,131
57.3	5,009,132
180.1	5,009,133
487	5,009,134
488	5,009,135

CLASS 82

127	5,009,136

CLASS 83

209	5,009,137
413	5,009,138
419	5,009,139
698	5,009,140
857	5,009,141

CLASS 84

454	5,009,142
604	5,009,143
612	5,009,145
615	5,009,146
618	5,009,147

CLASS 98

10	5,009,148
42.21	5,009,149

CLASS 99

360	5,009,150
445	5,009,151
476	5,009,152

CLASS 100

2	5,009,153
5	5,009,154
233	5,009,155

CLASS 101

177	5,009,156
178	5,009,157
219	5,009,158
351	5,009,159
422	5,009,160
425	5,009,161

CLASS 102

275.9	5,009,162
301	5,009,163
502	5,009,164
513	5,009,165
516	5,009,166
524	5,009,167

CLASS 104

172.1	5,009,168

CLASS 105

4.1	5,009,169

CLASS 106

35	5,009,709
105	5,009,708
208	5,009,710
415	5,009,711
456	5,009,712
727	5,009,713

CLASS 108

36	5,009,170

CLASS 110

109	5,009,171
242	5,009,172
244	5,009,173
264	5,009,174

CLASS 111

173	5,009,175

CLASS 112

121.12	5,009,176
292	5,009,177

CLASS 114

143	5,009,178
229	5,009,179
	5,009,180
230	5,009,181
238	5,009,182
253	5,009,183
361	5,009,184

CLASS 118

52	5,009,185
658	5,009,187

CLASS 119

3	5,009,188
	5,009,189
5	5,009,190
20	5,009,191
29	5,009,192
	5,009,193
72	5,009,194
86	5,009,195
101	5,009,196
159	5,009,197

CLASS 123

43 A	5,009,198
52 M	5,009,200
52 MF	5,009,199
65 BA	5,009,201
90.11	5,009,202
90.16	5,009,203
193 H	5,009,204
195 H	5,009,205
198 E	Re.33,575
248	5,009,206
261	5,009,207
335	5,009,208
415	5,009,209
489	5,009,210
491	5,009,211
533	5,009,212
620	5,009,213

CLASS 124

35.2	5,009,214
44.5	5,009,215
88	5,009,216

CLASS 126

152 B	5,009,217
452	5,009,218
523	5,009,219
	5,009,220
538	5,009,221

CLASS 128

36	5,009,222
80 C	5,009,223
156	5,009,224
201.24	5,009,225
205.18	5,009,226
207.17	5,009,227
380	5,009,228
419 P	5,009,229
633	5,009,230
	5,009,231
660.03	5,009,232
666	5,009,233
672	5,009,234
760	5,009,235
761	5,009,236

CLASS 131

70	5,009,237
108	5,009,238
342	5,009,239

CLASS 134

2	5,009,714
7	5,009,240
22.11	5,009,715
40	5,009,716
102	5,009,241
113	5,009,242

CLASS 136

201	5,009,717
232	5,009,718
246	5,009,243
249	5,009,719
255	5,009,720
256	5,009,721

CLASS 137

101.11	5,009,244
116.5	5,009,245
205.5	5,009,246
218	5,009,247
486	5,009,248
495	5,009,249
596.17	5,009,250
601	5,009,251
614.04	5,009,252

CLASS 139

116.2	5,009,253

CLASS 141

35	5,009,254

CLASS 144

1 R	5,009,255

CLASS 148

2	5,009,722
12 E	5,009,723
23	5,009,724
	5,009,725
111	5,009,726

CLASS 149

19.1	5,009,728
109.4	5,009,729

CLASS 152

221	5,009,256

CLASS 156

85	5,009,730
154	5,009,731
177	5,009,732
184	5,009,733
	5,009,734
241	5,009,735
250	5,009,736
264	5,009,737
345	5,009,738
353	5,009,740
384	5,009,739
483	5,009,741
633	5,009,742
643	5,009,743
656	5,009,744

CLASS 157

1.26	5,009,257

CLASS 160

168.1	5,009,258
310	B1 4,478,268
323.1	5,009,259

CLASS 162

5	5,009,745
	5,009,746
115	5,009,747
198	5,009,748
271	5,009,749

CLASS 164

255	5,009,260

CLASS 165

96	5,009,261
140	5,009,262
151	5,009,263

CLASS 166

106	5,009,264
118	5,009,265
245	5,009,266
271	5,009,267
274	5,009,268
293	5,009,269

CLASS 172

42	5,009,270

CLASS 174

23 C	5,010,209
34	5,010,210
48	5,010,211
52.2	5,010,212

CLASS 175

53	5,009,271
56	5,009,272
61	5,009,273
260	5,009,274

CLASS 177

25.13	5,009,275
25.15	5,009,276

CLASS 178

18 5,009,277
5,010,213

CLASS 180

9.44 5,009,278
197 5,009,279

CLASS 181

160 5,009,280
5,009,281

CLASS 182

6.17 5,009,286

CLASS 184

88 5,009,282
116 5,009,283
142 5,009,284
187 5,009,285

CLASS 187

8.41 5,009,287
20 5,009,288

CLASS 188

67 5,009,289
71.5 5,009,290
71.6 5,009,291
71.7 5,009,292
72.4 5,009,293

CLASS 192

1.22 5,009,294
4 A 5,009,295
20 5,009,296
84 C 5,009,297
85 C 5,009,299
88 B Re.33,576
98 5,009,300
106.2 5,009,301

CLASS 198

328 5,009,302
347.3 5,009,303
372 5,009,304
395 5,009,305
414 5,009,306
538 5,009,307

CLASS 200

6 B 5,010,214
50 A 5,010,215
61.45 M 5,010,216
61.45 R 5,010,217
84 R 5,010,218
408 5,010,219

CLASS 204

13 5,009,750
61 5,009,751
64 R 5,009,752
75 5,009,753
82 5,009,754
111 5,009,755
129.35 5,009,756
147 5,009,757
180.8 5,009,758
182.8 5,009,759
183.3 5,009,760
192.14 5,009,761
192.16 5,009,762
255 5,009,763
298.08 5,009,764
298.12 5,009,765
419 5,009,766

CLASS 206

204 5,009,308
219 5,009,309
229 5,009,310
332 5,009,311
387 5,009,312
391 5,009,313
427 5,009,314
5,009,315
443 5,009,316
466 5,009,317
524.8 5,009,318
544 5,009,319
607 5,009,320

CLASS 208

85 5,009,767
89 5,009,768
113 5,009,769
209 5,009,770
216 PP 5,009,771
309 5,009,772
391 5,009,773

CLASS 209

3.1 5,009,321
273 5,009,774
536 5,009,322
615 5,009,331
652 5,009,332

CLASS 210

85 5,009,775
108 5,009,776
134 5,009,777
198.2 5,009,778
223 5,009,779
238 5,009,780
247 5,009,781
360.1 5,009,782
500.41 5,009,783
512.1 5,009,784
512.2 5,009,785
602 5,009,786
634 5,009,787
639 5,009,788
641 5,009,789
689 5,009,790
695 5,009,791
705 5,009,792
710 5,009,793
739 5,009,794
744 5,009,795
787 5,009,796

CLASS 211

13 5,009,333
54.1 5,009,334
55 5,009,335
69.1 5,009,336
86 5,009,337

CLASS 215

230 5,009,338
252 5,009,323
276 5,009,324

CLASS 219

10.55 E 5,010,221
10.55 M 5,010,220
10.77 5,010,223
69.17 5,010,224
76.12 5,010,225
81 5,010,226
85.16 5,010,227
86.25 5,010,228
121.21 5,010,229
121.62 5,010,230
121.69 5,010,231
121.7 5,010,232
209 5,010,233
213 5,010,234
455 5,010,235

CLASS 220

374 5,009,325
441 5,009,326
890 5,009,327

CLASS 221

152 5,009,328
175 5,009,329
196 5,009,330

CLASS 222

1 5,009,339
94 5,009,340
130 5,009,341
136 5,009,342
192 5,009,343
325 5,009,344
556 5,009,345

CLASS 224

205 5,009,346
219 5,009,347
232 5,009,348
260 5,009,349
324 5,009,350

CLASS 225

52 5,009,351

CLASS 226

94 5,009,352
172 5,009,353

CLASS 227

2 5,009,354
114 5,009,355
120 5,009,356

CLASS 228

122 5,009,357
175 5,009,359
198 5,009,360

CLASS 229

1.5 R 5,009,361
117 5,009,362
120.17 5,009,363
123.2 5,009,364

CLASS 232

16 5,009,365
17 5,009,366

CLASS 235

379 5,010,237
5,010,238
382 5,010,240
441 5,010,239
462 5,010,241
467 5,010,242
488 5,010,243

CLASS 239

3 5,009,367
70 5,009,368
223 5,009,369

CLASS 241

24 5,009,370
187 5,009,371

CLASS 242

71.1 5,009,372
158 R 5,009,373

CLASS 244

1 R 5,009,374

CLASS 248

74.1 5,009,376
99 5,009,377
5,009,378
174 5,009,379
214 5,009,380
221.1 5,009,381
284 5,009,382
343 5,009,383
5,009,384
346 5,009,385
613 5,009,386

CLASS 249

96 5,009,387

CLASS 250

206.1 5,010,244
208.1 5,010,245
216 5,010,246
223 R 5,010,247
227.21 5,010,248
306 5,010,249
310 5,010,250
332 5,010,251
385.1 5,010,252
399 5,010,253
551 5,010,254

CLASS 251

65 5,009,388
129.1 5,009,389
129.2 5,009,390
149.1 5,009,391
180 5,009,392
207 5,009,393

CLASS 252

8.551 5,009,797
5,009,798
8.553 5,009,799
8.9 5,009,800
48.2 5,009,802
49.5 5,009,803
90 5,009,804
033.2 5,009,801
174.24 5,009,805
187.28 5,009,806
301.4 H 5,009,807
301.60 S 5,009,808
350 5,009,809
5,009,810
500 5,009,811
5,009,812
545 5,009,813
548 5,009,814
582 5,009,815

CLASS 254

30 5,009,394

CLASS 261

21 5,009,816

CLASS 264

0.5 5,009,817
1.003 5,009,818
4.1 5,009,819
13 5,009,820
22 5,009,821
23 5,009,822
29.7 5,009,823
45.1 5,009,824
148 5,009,825
154 5,009,826
156 5,009,827
177.1 5,009,828
210.6 5,009,829
290.5 5,009,830
510 5,009,831
571 5,009,832

CLASS 266

92 5,009,395
115 5,009,396
197 5,009,397
199 5,009,398
237 5,009,399

CLASS 267

64.11 5,009,400
64.21 5,009,401
140.1 5,009,402
5,009,403
5,009,404
273 5,009,405

CLASS 269

17 5,009,406
322 5,009,407

CLASS 270

57 5,009,408

CLASS 271

90 5,009,409
127 5,009,410
129 5,009,411

CLASS 272

1 B 5,009,413
2 5,009,412
76 5,009,414
114 5,009,415
143 5,009,416
145 5,009,417

CLASS 273

26 R 5,009,420
30 5,009,421
73 D 5,009,422
80.2 5,009,423
85 D 5,009,424
167 R 5,009,425
186 A 5,009,426
232 5,009,427
5,009,428
240 5,009,429
255 5,009,430
258 5,009,431
339 5,009,432
419 5,009,433
448 5,009,418
454 5,009,419

CLASS 277

1 5,009,434
23 5,009,435
80 5,009,436
88 5,009,437
235 B 5,009,438

CLASS 279

62 5,009,439
71 5,009,440

CLASS 280

14.2 5,009,441
304.1 5,009,442
477 5,009,443
5,009,444
5,009,445
479.2 5,009,446
661 5,009,447
673 5,009,448
690 5,009,449
707 5,009,450
724 5,009,451
730 5,009,452
804 5,009,453

CLASS 285

24 5,009,454
106 5,009,455

CLASS 292

173 5,009,456

CLASS 296

3 5,009,457
37.13 5,009,458
84.1 5,009,459
93 5,009,460
146 5,009,461
201 5,009,462
210 5,009,463
213 5,009,464
219 5,009,465

CLASS 297

323 5,009,466
411 5,009,467
412 5,009,468
468 5,009,469

CLASS 307

106 5,010,255
263 5,010,256
446 5,010,257
469 5,010,258
482 5,010,259
482.1 5,010,260
571 5,010,261

CLASS 310

12 5,010,262
68 B 5,010,263
72 5,010,264
88 5,010,265
156 5,010,266
162 5,010,267
254 5,010,268
313 B 5,010,269
313 D 5,010,270
332 Re.33,577

CLASS 312

325 5,009,470

CLASS 313

412 5,010,271
579 5,010,272

CLASS 315

39.61 5,010,273
101 5,010,274
106 5,010,275
111.21 5,010,276
200 R 5,010,277
224 5,010,278
227 R 5,010,279
384 5,010,284
388 5,010,280
411 5,010,281

CLASS 318

116 5,010,222
254 5,010,282
373 5,010,283
569 5,010,285
571 5,010,286
801 5,010,287
811 5,010,288

CLASS 322

8 5,010,289

CLASS 323

222 5,010,291
274 5,010,292
278 5,010,293

CLASS 324

158 D 5,010,294
158 P 5,010,296
158 R 5,010,295
5,010,297
173 5,010,290
207.19 5,010,298
209 5,010,299
309 5,010,300
376 5,010,301

CLASS 330

107 5,010,302
257 5,010,303
269 5,010,304
277 5,010,305
284 5,010,306

CLASS 331

116 FE 5,010,307
116 R 5,010,308

CLASS 333

206 5,010,309

CLASS 335

216 5,010,311
243 5,010,310
261 5,010,312
296 5,010,313

CLASS 336

198 5,010,314

CLASS 338

7 5,010,315
238 5,010,316

CLASS 340

311.1 5,010,317
439 5,010,318
472 5,010,319
551 5,010,320
600 5,010,321
700 5,010,322
706 5,010,323
723 5,010,324
781 5,010,325
784 5,010,326
5,010,327
5,010,328
825.080 5,010,329
825.21 5,010,330
825.310 5,010,331
825.5 5,010,332
856 5,010,333
870.28 5,010,334
5,010,335
907 5,010,336

CLASS 341

65 5,010,344
5,010,345
137 5,010,346
143 5,010,347
154 5,010,337
159 5,010,338
164 5,010,339
172 5,010,340

CLASS 342

20 5,010,341
169 5,010,342
432 5,010,343

CLASS 343

700 MS 5,010,348
5,010,349
704 5,010,350
771 5,010,351

CLASS 346

76 PH 5,010,352
108 5,010,353
138 5,009,509
140 R 5,010,354
5,010,355
5,010,356

CLASS 350

4.1 5,009,471
6.5 5,009,472
6.6 5,009,473
96.10 5,009,475
96.11 5,009,476
96.15 5,009,477
5,009,478
5,009,479
5,009,480
96.18 5,009,481
5,009,482
96.2 5,009,474
96.24 5,009,483
162.11 5,009,484
163 5,009,485
164 5,009,486
286 5,009,487
315 5,009,488
341 5,009,489
342 5,009,490
427 5,009,491
5,009,492
619 5,009,493
620 5,009,494

CLASS 351

153 5,009,495
156 5,009,496
161 5,009,497
164 B1 4,645,317
212 5,009,498

CLASS 352

35 5,009,499

CLASS 354

159 5,010,357
402 5,010,358
410 5,010,359

CLASS 355

20 5,010,360
52 5,010,361
74 5,010,362
206 5,010,363
207 5,010,364
211 5,010,365
240 5,010,366
247 5,010,367
259 5,010,368
273 5,010,369
274 5,010,370
313 5,010,371
5,010,372
319 5,010,373

CLASS 356

43 5,009,500
152 5,009,501
5,009,502
339 5,009,503
350 5,009,504
352 5,009,505
356 5,009,506
421 5,009,507

CLASS 357

16 5,010,374
5,010,375
17 5,010,376
22 5,010,377
23.13 5,010,380
23.6 5,010,378
5,010,379
30 5,010,381
34 5,010,382

36 5,010,383
38 5,010,384
41 5,010,385
42 5,010,386
67 5,010,389
70 5,010,387
5,010,388
408 5,010,485
72 5,010,390

CLASS 358

14 5,010,391
21 R 5,010,392
29 5,010,393
5,010,394
44 5,010,395
60 5,010,396
5,010,397
80 5,010,398
85 5,010,399
86 5,010,400
136 5,010,401
138 5,010,402
139 5,010,403
5,010,404
141 5,010,405
147 5,010,406
183 5,010,407
213.11 5,010,408
213.19 5,010,409
214 5,010,410
230 5,010,411
240 5,010,412
242 5,010,413
244 5,010,414
302 5,010,415
314 5,010,416
335 5,010,417
5,010,418
5,010,419
471 5,010,420

CLASS 360

32 5,010,421
69 5,010,422
77.06 5,010,423
77.140 5,010,424
78.04 5,010,425
97.01 5,010,426
99.05 5,010,427
99.06 5,010,428
103 5,010,429
5,010,430
5,010,431
108 5,010,432
113 5,010,433
132 5,010,434
133 5,010,435
137 5,010,436
5,010,437

CLASS 361

56 5,010,438
91 5,010,439
215 5,010,440
221 5,010,441
275 5,010,442
321 5,010,443
386 5,010,444
392 5,010,445
398 5,010,446
400 5,010,447
403 5,010,448
414 5,010,449
415 5,010,450
504 5,010,451

CLASS 362

19 5,010,452
61 5,010,453
5,010,454
5,010,455
5,010,456
66 5,010,457
80 5,010,458
85 5,010,459
101 5,010,460
5,010,461
109 5,010,462
253 5,010,463
284 5,010,464
337 5,010,465

CLASS 363

16 5,010,466
37 5,010,467
5,010,468
5,010,469
132 5,010,470
160 5,010,471

CLASS 364

148 5,010,472
150 5,010,473
167.01 5,010,474
200 5,010,475
5,010,476
5,010,477
5,010,478
5,010,479
5,010,480
5,010,481
5,010,482
5,010,483
5,010,485
419 5,010,486
424.03 5,010,487
424.05 5,010,488
426.02 5,010,489
426.04 5,010,490
474.28 5,010,491
474.29 5,010,492
490 5,010,493
507 5,010,494
513.5 5,010,495
519 5,010,496
5,010,497
5,010,498
521 5,010,499
5,010,500
522 5,010,501
5,010,502
569 5,010,503
574 5,010,504
713 5,010,505
721 5,010,506
724.01 5,010,507
748 5,010,508
5,010,509
758 5,010,510
786 5,010,511
807 5,010,512
900 5,010,513
5,010,514
5,010,515

CLASS 365

49 5,010,516
114 5,010,517
145 5,010,518
149 5,010,519
174 5,010,520
189.01 5,010,521
189.07 5,010,522
205 5,010,523
5,010,524

CLASS 366

10 5,009,508
311 5,009,510
348 5,009,511

CLASS 367

13 5,010,525
46 5,010,526
86 5,010,527
90 5,010,528
137 5,010,529
154 5,010,530
188 5,010,531

CLASS 368

88 5,010,532
223 5,010,533

CLASS 369

32 5,010,534
5,010,535
36 5,010,536
44.32 5,010,537
44.36 5,010,538
50 5,010,539
5,010,540
77.2 5,010,484
107 5,010,541

CLASS 370

1 5,010,542
3 5,010,543
13.1 5,010,544
56 5,010,545
85.11 5,010,546
94.1 5,010,547
95.1 5,010,548
110.1 5,010,549

CLASS 371

8.2 5,010,550
16.4 5,010,551
27 5,010,552
35 5,010,553
37.1 5,010,554

CLASS 372

2 5,010,555
46 5,010,556

CLASS 374

6 5,009,512
31 5,009,513
138 5,009,514

CLASS 375

1 5,010,557
37 5,010,558
116 5,010,559

CLASS 376

217 5,009,833
232 5,009,834
251 5,009,835
260 5,009,836
261 5,009,837
310 5,009,838
352 5,009,839
435 5,009,840

CLASS 377

20 5,010,560
47 5,010,561

CLASS 378

125 5,010,562
132 5,010,563
176 5,010,564

CLASS 379

61 5,010,565
5,010,566
77 5,010,567
107 5,010,568
210 5,010,569
390 5,010,570

CLASS 380

4 5,010,571
21 5,010,572
28 5,010,573

CLASS 381

42 5,010,574
68 5,010,575
71 5,010,576
104 5,010,577

CLASS 382

8 5,010,578
13 5,010,579
17 5,010,580
56 5,010,581

CLASS 383

23 5,009,515
37 5,009,516
72 5,009,517
106 5,009,518

CLASS 384

94 5,009,519
100 5,009,520
191.1 5,009,521
288 5,009,522
475 5,009,523
5,009,524
576 5,009,525

CLASS 388

815 5,010,582

CLASS 400

56 5,009,526
120 5,009,527
124 5,009,528
5,009,529
188 5,009,530
240.3 5,009,531
636.2 5,009,532

CLASS 401

65 5,009,533
75 5,009,534
195 5,009,535
198 5,009,536

CLASS 402

21 5,009,537

CLASS 403

134 5,009,538
370 5,009,539
405.1 5,009,540

CLASS 404

6 5,009,541
5,009,542
70 5,009,543
72 5,009,544
100 5,009,545
110 5,009,546
112 5,009,547

CLASS 405

179 5,009,548
261 5,009,549

CLASS 406

87 5,009,550
128 5,009,551
193 5,009,552

CLASS 408

1 R 5,009,553

CLASS 409

231 5,009,554
232 5,009,555

CLASS 411

15 5,009,556
504 5,009,557

CLASS 414

23 5,009,558
259 5,009,559
392 5,009,560
412 5,009,561
440 5,009,562
470 5,009,563
510 5,009,564
607 5,009,565
722 5,009,566
786 5,009,567

CLASS 415

3.1 5,009,568
4.1 5,009,569
174.2 5,009,570

CLASS 416

79 5,009,571

CLASS 417

32 5,009,572
53 5,009,573
222 5,009,574
244 5,009,575
295 5,009,576
5,009,577
365 5,009,578
413 5,009,579
533 5,009,580
540 5,009,581

CLASS 418

61.3 5,009,582
104 5,009,583

CLASS 419

23 5,009,841
28 5,009,842

CLASS 420

112 5,009,843
548 5,009,844

CLASS 422

56 5,009,845
5,009,846
61 5,009,847
62 5,009,848
83 5,009,849
99 5,009,850
141 5,009,851
143 5,009,852
144 5,009,853
150 5,009,854
164 5,009,855
178 5,009,856
180 5,009,857
186.19 5,009,858
189 5,009,859
245 5,009,861
249 5,009,862
5,009,863
5,009,864
5,009,865
250 5,009,860

CLASS 423

73 5,009,866
139 5,009,868
210 5,009,869
239 5,009,870
240 5,009,871
245.3 5,009,872
320 5,009,873
335 5,009,874
477 5,009,875
598 5,009,876
607 5,009,877
608 5,009,878
610 5,009,879

CLASS 424

49 5,009,881
52 5,009,882
5,009,883
5,009,884
53 5,009,885
58 5,009,886
59 5,009,969
76.1 5,009,887
94.3 5,009,888
94.64 5,009,889
047 5,009,880
195.1 5,009,890
195.100 5,009,891
422 5,009,892
440 5,009,893
451 5,009,894
465 5,009,895
467 5,009,896
469 5,009,897
618 5,009,898

CLASS 425

135 5,009,584
174.4 5,009,585
311 5,009,586
549 5,009,587

CLASS 426

2 5,009,899
96 5,009,900
112 5,009,901
128 5,009,867
138 5,009,902
243 5,009,903
5,009,904
297 5,009,905
330.4 5,009,906
335 5,009,907
454 5,009,908
481 5,009,909
499 5,009,910
578 5,009,911
580 5,009,912
581 5,009,913
582 5,009,914
615 5,009,915
5,009,916
631 5,009,917
643 5,009,918

CLASS 427

1 5,009,919
9 5,009,920
31 5,009,921
37 5,009,922
38 5,009,923
44 5,009,924
48 5,009,925
55 5,009,926
121 5,009,927
126.3 5,009,928
130 5,009,929
195 5,009,931
236 5,009,930
243 5,009,932
287 5,009,933
387 5,009,934
407.1 5,009,936
440 5,009,937

CLASS 428

31 5,009,938
34.2 5,009,939
35.7 5,009,940
36.3 5,009,941
36.6 5,009,942
40 5,009,943
5,009,944
76 5,009,945
87 5,009,946
122 5,009,947
141 5,009,948
260 5,009,949
290 5,009,950
294 5,009,951
319.1 5,009,952
327 5,009,953
400 5,009,954
401 5,009,955
402.2 5,009,956
402.22 5,009,957
411.1 5,009,958
419 5,009,959
423.1 5,009,960
446 5,009,961
457 5,009,935
470 5,009,962
472.2 5,009,963
526 5,009,964
546 5,009,965
627 5,009,966

CLASS 429

23 5,009,967
26 5,009,968
192 5,009,970
252 5,009,971

CLASS 430

7 5,009,972
45 5,009,973
59 5,009,976
69 5,009,974
84 5,009,977
96 5,009,975
109 5,009,978
110 5,009,979
114 5,009,980
175 5,009,981
280 5,009,982
372 5,009,983
404 5,009,984
430 5,009,985
495 5,009,986
5,009,987
505 5,009,988
512 5,009,989
539 5,009,990
567 5,009,991
573 5,009,992
605 5,009,993

CLASS 431

31 5,009,588
183 5,009,589

CLASS 432

121 5,009,590
128 5,009,591
222 5,009,592

CLASS 433

73 5,009,594
140 5,009,595
173 5,009,596
212.1 5,009,597
221 5,009,593

CLASS 434

30 5,009,598
81 5,009,599
82 5,009,600
260 5,009,601
300 5,009,602
323 5,009,603

CLASS 435

4 5,009,994
7 5,009,996
7.23 5,009,995
7.4 5,009,997
7.92 5,009,998
29 5,009,999
69.1 5,010,000
5,010,001
69.2 5,010,002
69.9 5,010,003
134 5,010,004
147 5,010,005
177 5,010,006
190 5,010,007
202 5,010,008
240.243 5,010,009
252.3 5,010,010
5,010,011
280 5,010,012
285 5,010,013
310 5,010,014
320 5,010,015

CLASS 436

63 5,010,016
77 5,010,020
120 5,010,021
123 5,010,022
500 5,010,017

CLASS 437

3 5,010,018
8 5,010,019
5,010,023
24 5,010,024
29 5,010,025
31 5,010,026
41 5,010,027
43 5,010,028
44 5,010,029
51 5,010,031
57 5,010,032
83 5,010,033
89 5,010,034
100 5,010,035
173 5,010,036
192 5,010,030
200 5,010,037
215 5,010,038
228 5,010,039
230 5,010,040

CLASS 439

15 5,009,604
59 5,009,606
67 5,009,605
5,009,607
73 5,009,609
142 5,009,610
326 5,009,611
331 5,009,608
403 5,009,612
482 5,009,613
497 5,009,614
595 5,009,615
608 5,009,616
679 5,009,617
736 5,009,618

CLASS 440

53 5,009,619
72 5,009,620
75 5,009,621
88 5,009,622

CLASSIFICATION OF PATENTS

CLASS 441

56 5,009,623

CLASS 446

71 5,009,624
92 5,009,625
391 5,009,626

CLASS 453

10 5,009,627

CLASS 455

9 5,010,583
83 5,010,584
118 5,010,585
605 5,010,586
618 5,010,587
619 5,010,588

CLASS 464

111 5,009,628

CLASS 474

80 5,009,629
211 5,009,630
213 5,009,631

CLASS 493

189 5,009,632
214 5,009,633

CLASS 501

4 5,010,041
32 5,010,042
90 5,010,043
93 5,010,044
96 5,010,045
117 5,010,046

CLASS 502

24 5,010,047
60 5,010,049
61 5,010,048
301 5,010,050
304 5,010,051
5,010,052

CLASS 505

1 5,010,053
5,010,054

CLASS 514

8 5,010,055
12 5,010,056
23 5,010,058
25 5,010,059
49 5,010,060
54 5,010,061
5,010,062
56 5,010,063
58 5,010,064
5,010,065
75 5,010,066
5,010,067
79 5,010,068
018 5,010,057
166 5,010,069
171 5,010,070
178 5,010,071
183 5,010,072
185 5,010,073
213 5,010,074
218 5,010,075
221 5,010,076
228.8 5,010,077
252 5,010,078
253 5,010,079
255 5,010,080
263 5,010,081
272 5,010,082
292 5,010,083
293 5,010,084
299 5,010,085
303 5,010,086
307 5,010,087
312 5,010,088
314 5,010,089
326 5,010,090
357 5,010,091
359 5,010,092
374 5,010,093
399 5,010,094
400 5,010,095
411 5,010,096
419 5,010,097
426 5,010,098
459 5,010,099
461 5,010,100
462 5,010,101
473 5,010,102
495 5,010,103
510 5,010,104
5,010,105
546 5,010,106
563 Re.33,574
578 5,010,107
619 5,010,108
714 5,010,109
758 5,010,110

CLASS 521

56 5,010,111
76 5,010,112
107 5,010,113
109.1 5,010,114
154 5,010,115
155 5,010,116
159 5,010,117

CLASS 522

31 5,010,118

CLASS 523

205 5,010,119
219 5,010,120
336 5,010,121

CLASS 524

80 5,010,122
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5,009,667
5,009,673
5,009,866
5,010,565
50 : 5,010,524
51 : 5,008,959
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5,009,058
5,009,307
5,009,497
5,009,550
5,009,576
5,009,634
5,009,820
5,009,830
5,009,839
5,010,197
5,010,399
53 : 5,008,974
5,009,010
5,009,033
5,009,102
5,009,133
5,009,143
5,009,151
5,009,165
5,009,181
5,009,227
5,009,394
5,009,446
5,009,458
5,009,496
5,009,563
5,010,346
5,010,412
5,010,469
5,010,505
54 : 5,009,367
55 : 5,009,075
5,009,101
5,009,208
5,009,216
5,009,260
5,009,303
5,009,545
5,009,621
5,009,650
5,009,745
5,009,746
5,009,848
5,010,011
5,010,092
5,010,255
5,010,267
5,010,487

DESIGN PATENTS

01 :	316,438		316,445		316,366		316,454		316,378	46 :	316,440
04 :	316,346		316,452		316,382	26 :	316,334		316,428	47 :	316,327
05 :	316,451		316,459		316,399	27 :	316,329		316,435		316,331
06 :	316,336		316,461		316,417		316,330		316,439		316,332
	316,338	09 :	316,358		316,468		316,350		316,441		316,456
	316,364		316,360	18 :	316,352		316,391		316,463	48 :	316,372
	316,367		316,375		316,392	28 :	316,363	37 :	316,471		316,447
	316,384		316,423	20 :	316,453	29 :	316,470	38 :	316,393		316,460
	316,389	12 :	316,325	21 :	316,357	32 :	316,322	39 :	316,388		316,466
	316,394		316,383		316,457		316,377	40 :	316,328		316,469
	316,395		316,449	24 :	316,326	34 :	316,369	41 :	316,323	49 :	316,418
	316,398	13 :	316,340		316,464		316,370		316,324	51 :	316,403
	316,402	17 :	316,337	25 :	316,351	35 :	316,362		316,413		316,437
	316,409		316,355		316,359	36 :	316,343	42 :	316,361	53 :	316,412
	316,429		316,365		316,414		316,347		316,436	55 :	316,335

PLANT PATENTS

06 : 7,502	7,503	7,504	7,505	7,506	7,507

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